

T

Oranda

BR

- Edinburg

Chazy

{ Lincolnshire  
New Market



Locklich  
Herland

p. 2

Oct. 18, 1951  
Tumbling Brook Section, Va.

New Market - Massive lithographic  
gray ls. Tetradium - now  
siliceous

Lincolnshire - Thin bedded black ls.

10-1

weathers gray, carries  
silicified fauna, contains  
black nodules

10-1 near base, 30' ± above  
contact

Photo 1 - close up

" 2 New Market at base,

coll. of bean bag (photo 1)

} 1/25  
F5

Photo 3 close up white marking  
f 11 - 1/50

10-2

50' ± above base 6" bed  
? Sowerby. tes zone? may be  
below the zone  
directly above photo 3



photo 4 - Hammer on metabentonite?  
bed near top of Lincolnshire.  
cobbley ls above Edinburg  
or close to it. f 11 50. 17' ±

10-3 metabentonite? bed 1 photo  
4, approx 1' thick

Discarded, etc shows nothing.

~~10-4 Shale parting in Edinburg~~

10-5 ls above sh.

↑ about middle of Edinburg  
right above house (brick)  
± below Telephone line  
crossing rd.



10-6 Orands  
2.1' US Hway 11 - 0.4 mile  
W. of Tumbling Run, N side  
of rd.

10-7 same S side of rd.  
(photo 5) at 10-7  
looking E.



Collins  
NAME Loeblich

December 3, 1951  
DATE

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

Miss G. Collins, Md. Geol. Survey took party to Paleocene localities in Prince Georges Co., Md.

Loc.1 -First Paleocene loc. found in Md.

Lanham quad., about 1 mile W., SW., of Brightseat Take Sherrif Rd. west of Brightseat, cross calvert and turn S. on first private Rd. At house turn W. past 2 barns. Creek that starts as spring N. of fence and W of last barn. About 10' exposed in creek, base not exp.

12-3-1 Shell bed, 9'-10' below top of fm.

12-3-2 Approx. middle of formation, some shells

12-3-3 Top of Paleocene, overlain by leached brown ~~material~~ material containing phosphatic nodules.

The formation is sandy near base, more claye near top.

Loc. 2 - Creek to E of same barn as loc.1, this creek curves around houses and crosses Sherrif Rd. at calvert.

10-3-4 Near top of Paleocene, shell bed.

10-3-5 Down stream, Cretaceous clay, fossils better preserved, more pearly, overlain by sandy Paleocene (12-3-6)

12-3-6 Paleocene, less than 1 foot above Cretaceous.



Loeblich  
NAME Hessland

DATE Oct. 18, 1951

Tumbling Brook section, Virginia

Newmarket - Massive, lithographic gray ls.  
non siliceous

Lincolnshire - Thin bedded black ls., contains  
black nodules, weathers gray, silicified  
fossils

10-1 Near base, about 30' above contact.

10-2 About 50' above base, 6" bed, ?Sowerbyites zone.

10-3 Metabentonite - Discarded, no fossils

10-4 Shale parting in Edinburg. Discarded

10-5 Ls. above shale, about middle of Edinburg,  
right above brick house and below telephone line  
crossin road.

10-6 Cranda, US Hway 11, 0.4 miles W. of Tumbling Run,  
N. side of road.

10-7 Same as above, S. side of road. \*Tower

Strausburg Junction

10-8 Lower portion of Edinburg

10-9 About 10' below 10-8

10-10 " 10' below 10-9

10-11 " 20' below 10-10, on line with telephone pole

10-12 40'-60' above 10-8, near Middle of Edinburg



Strausburg Junction

Edinburg

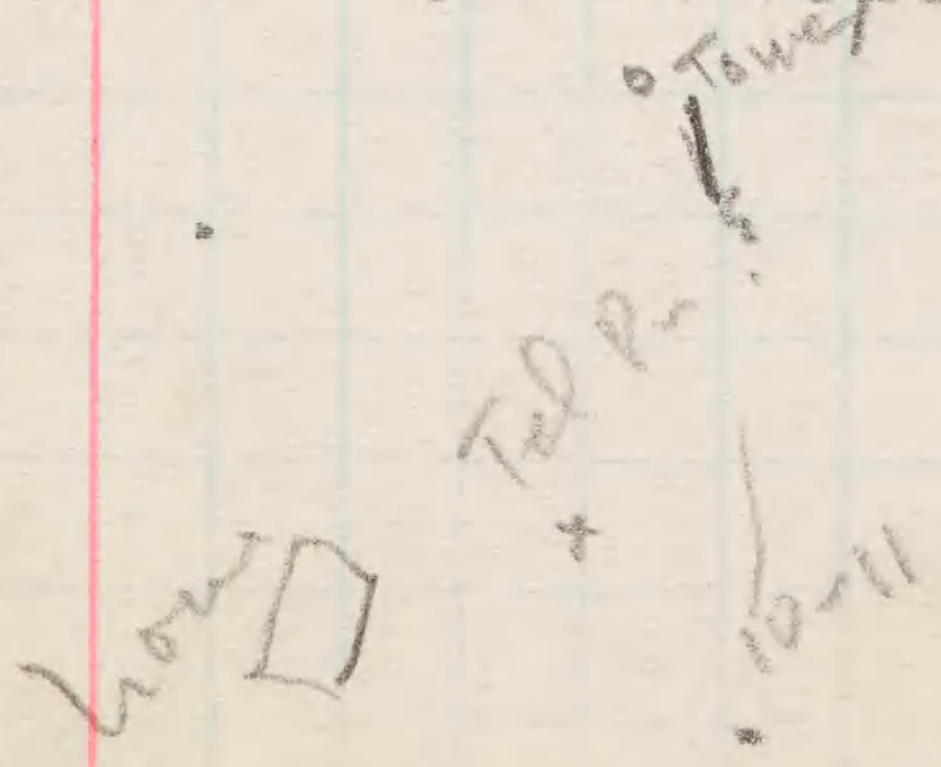
10-8 ~~Middle~~ Lower portion  
photo-6 outcrop of 10-8  
in field. F 11 1/50 - 6'  
photo. 7 view of same

10-9 same as 8, 10' ± below 8

10-10 10' ± below 10-9

10-11 20' ± below 10-10

on line with Tel. Pole





10-12 <sup>start above</sup> ~~below~~ 7-40'-60' 10-8

near middle of ~~line~~  
Edinburgh. slightly  
below site of Tree.



Cooke  
Shepherd  
Hessland

Oct 22, 1951

Piscataway Cr. Locality, new  
rd. 7 mi.  $\pm$  from Dist. Ct. line.

Indian Head Rd. N of Piscataway  
Cr. Prince Georges Co. Md.  
N. of bridge, rd. cut

Ogema -

10-21-3  $\xrightarrow{4' \pm \text{above contact}}$  (Marlboro clay)  
Nonjemog

10-21-2

$\xrightarrow{\text{ogema shells}}$

10-21-1

$\xrightarrow{\text{lower shell}}$   
Turritella mortoni

Nonjemog - yellowish clay  
iron concretions at this local  
(Lower member of Nonjemog)  
Well met.

(Photo 23 by Hessland  
of outcrop)

Summits Loc. (F?)



10-22-51

Corke  
Stephenson  
Hendland

Fort Washington

10-22-4 Moxmouth - 4' above  
base contact of Patuxco  
face bored by bee holes  
no fossils  
11/8/52

basal cgl of Moxmouth  
 1 1/2' cgl.  
 2' more to  
 coll - 10-22-4



10-22-51

Crook  
Stephen  
Harden

Upper Marlboro

md. 202 to car yard

10-22-5

2" below Marlboro

Agua

10-27-6

2" above contact

Marlboro clay

Addison Rd

.65 mi S of Central Ave.

10-22-7

Paleocene, 0.65 m. S. of  
Central Ave on Addison Rd.  
below contact with Agua.

10-27-8

Agua, bed, just above  
Paleocene, Addison Rd



12-3-51

p. 1

Miss G. Collins, Md. G. S.  
Took party To Paleocene localities  
in Prince Georges Co. Md.

Loc. 1. (First loc. of Paleocene  
ever found in Md.)

Lanham  $\square$  about 1 mile W, SW  
of Brightseat, Take Sherrif rd W.  
of Brightseat cross culvert and  
turn S on first private rd. at  
house turn W past 2 barns.  
Cr. W. of last barn that starts  
as spring N of fence.

about 10' Paleocene exposed  
in Cr. base not exp.

12-3-1 Shell bed 9'-10' below Top of  
fm.

12-3-2 approx middle of fm., some  
shells.

12-3-3 Top of Paleocene, near B.M. stake.  
Overlain by leached brown  
material containing phosphate  
nodules.

The formation is more clayey  
near top, sandier near base.



12-3-51

p. 2

loc. 2

Creek to E of same barn as loc. 1  
Cr. curves around houses and  
crosses Sherry rd at culvert.

12-3-4 Near Top of Paleocene, shell bed

12-3-5 Down stream. Cretaceous  
clay, fossils better preserved,  
Ammonite, overlain by sandy  
base of Paleocene. (12-3-4b)

12-3-6 Paleocene less than foot above  
Cretaceous

Loc. 3

Addison Rd. 0.6 mi. E of Central Ave

12-3-7 Cret. crops out in Cr. W of House  
across rd from cut.

12-3-8 Walk Cr. upstream past pig pens  
to exposure. Paleocene 3' ± below  
Top

12-3-9 Agave just above contact of 12-3-8.  
No ostr.  
Disc. 2/66

See 1/26/53



NAME

DATE

1/26/53

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Paleocene Lohanian □

1/26/53-1 Loc. 1 lower outc.  
Approx same as 12-3-1, 1951

1/26/53-2 Loc. 1 upper outc.  
approx same as 12-3-2, 1951

Loc. 2

second Cr. same as 12-3-51, p. 2.

1/26/53  
2 bags.

Cretaceous below contact  
2-5' ± below Exogyra.  
and associated with  
well preserved nautilus  
shells.

Walked up stream to  
head saw exogyra and  
nautilus shells -  
no Paleocene ??



May 8, 1952

Dr W.C.

Film 1 B&W. Knight #38" <sup>Werner on Top</sup>  
 yellow  
12850 52-5-8-1 1" x 1/2" shale parting  
 betw. 2 Lss. beds.

Ostracodes

See map with (X)



May 9, 1952, p.1

Keeper Cr. Loc. 100 yd from  
type sec. of Fern Glen.Fern Glen

collect

Bushbergsandy white or  
oolitic ss.(593) 4' Glen PK.  
sh.

(5-9-1) 16" shale unknown ge, "Ammodiscus"

Kimiswick

collect

River

mesan h.

PK at red house  
drop down to RivSee Manchester ☐



May 9, p. 2

RR Tracks stop car at gate

chert, bluish greenist 5-9-5- Fern Glen Station "Type loc."

red bedded 5-9-3 "Fern Glen Ls." in Mo.  
5-9-4

Red, green or gray

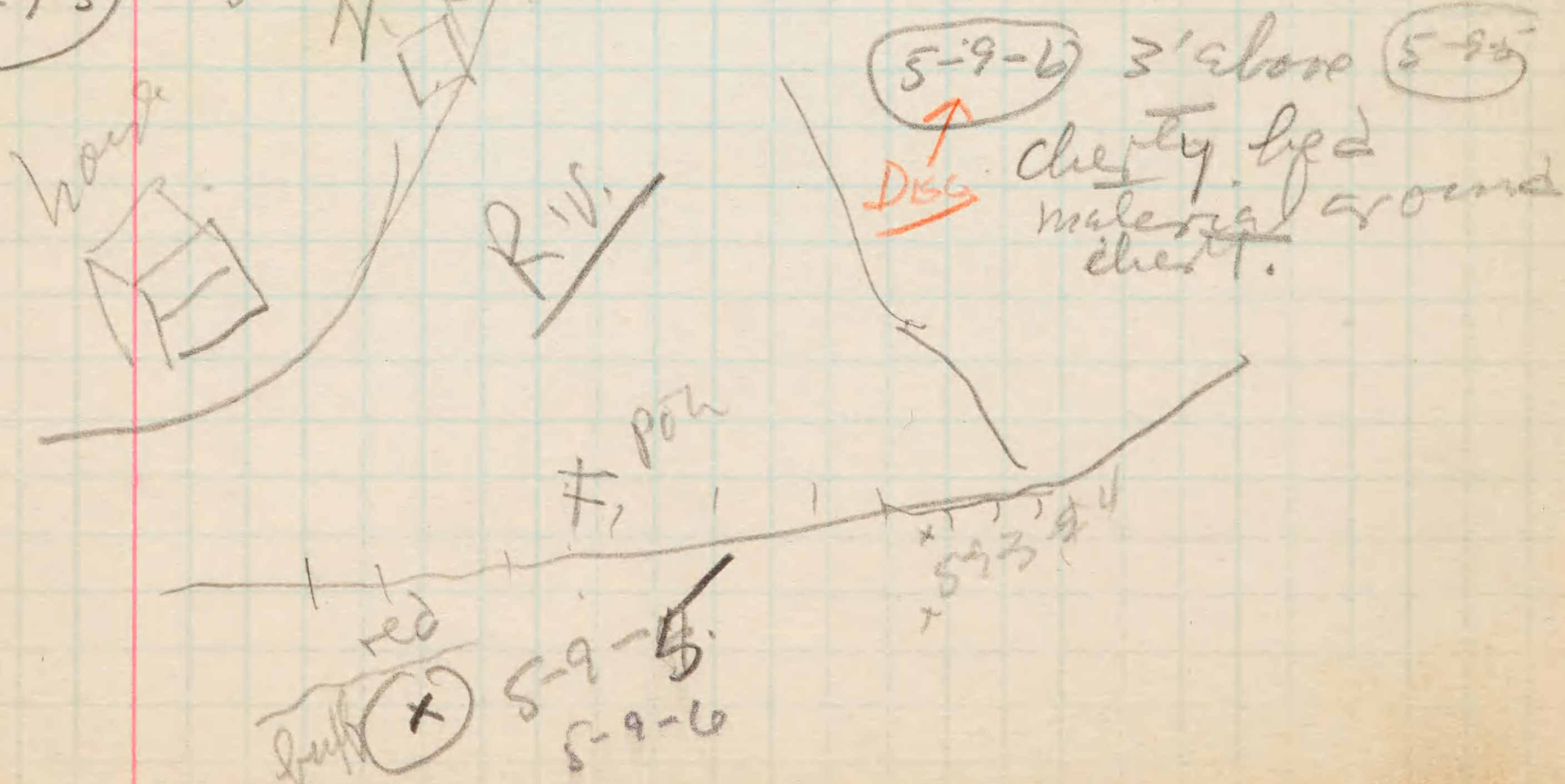
Collect in detail. Has ostracods

Old RR track below present level.

5-9-3 red shale at level of power line ostr.

5-9-4 Ls. at level  $\frac{1}{2}$  between tracks & ditch

5-9-5 buff colored above red.





Ostip  
Bushberry?

BURLINGTON

Gr. S. fine 6-4' ss. local cgl

131  
weathered conglomeratic zone

151 ss

Gr. S. cgl, ss.

141  
Munsuck

Ben Keenan, 1940

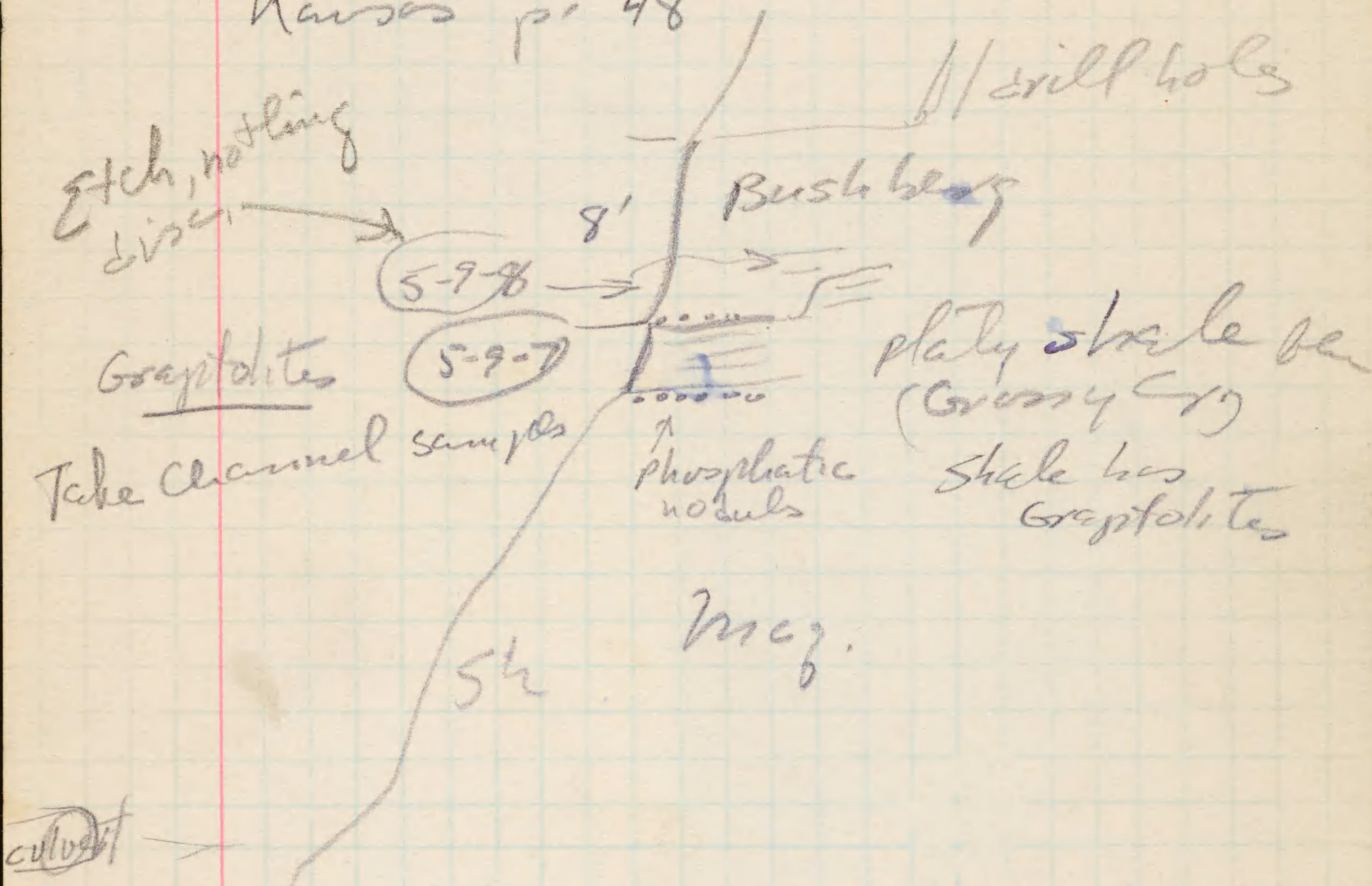
with ostracods; (discontinuity)

Section at Cottlewood.



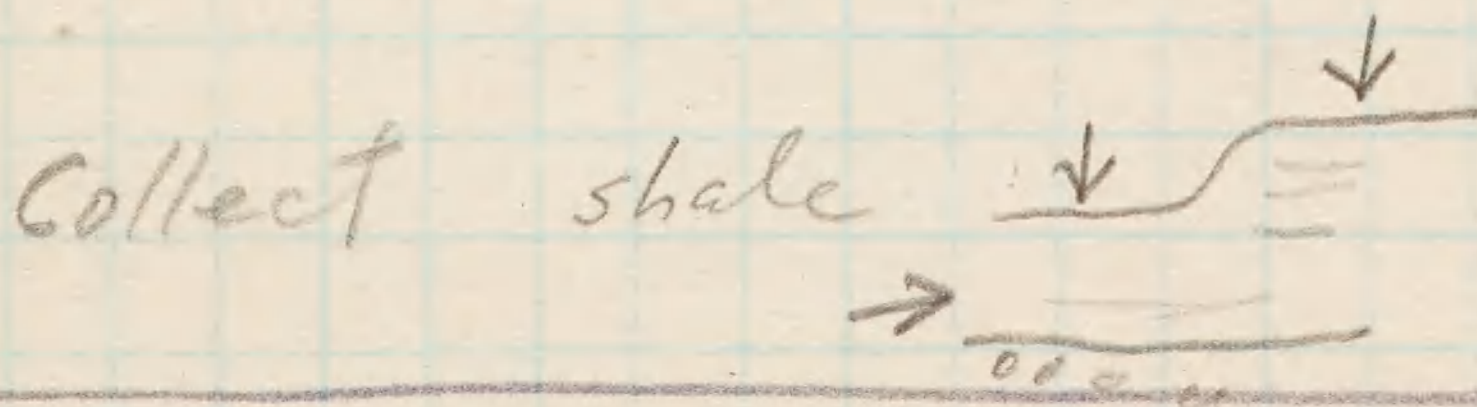
castlewood  
~~Castleford~~ section  
 Kansas p. 48

May 9 p. 3



milepost #?

5-9-7 middle of Grossy Cr. sh. which contains graptolites



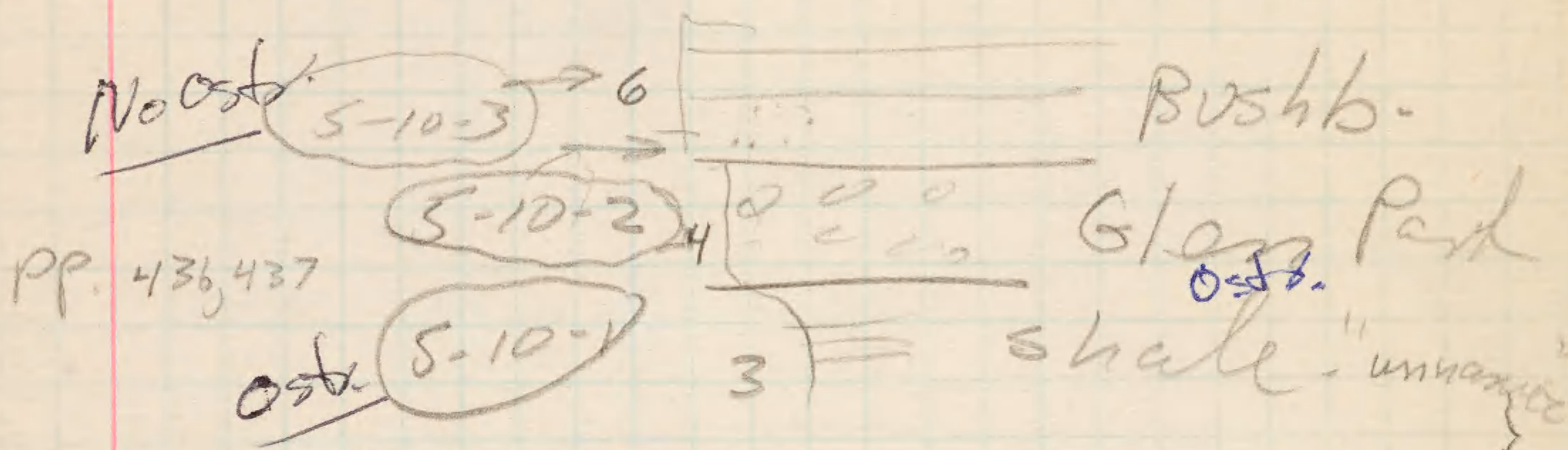


19

May 10, 1952

P.1

See Fauna of the Glen Park Ls.: St. Louis Acad. Sci. Trans. vol. 16 no. 7 pp. 436-471, 1906.



Quarry on hill at 2nd bend of Tunnels, N. end of Quarry.

Galtz Quarry

5-10-4 slab near Tunnel Glen Park  
Just above sandy zone at base

1st set of tunnels has  
ostracodes in Kimsu.

7/2



May 11, 1952

P. 1

(5-11-1)

S. wall

RR cut due S of Annex  
 "B" of the Arena. E end of  
 cut. Prob. Knight's loc.  
 37. slump? clay with ls.  
 Prob. L. Ft. Scott.



5-11-1



NAME Cooke, Stephenson  
Hessland

DATE Oct. 22, 1951

Piscataway Creek locality  
Indian Head Rd., about 7 miles from District line  
Schmidt's loc. F?

10-21-3 about 4' above contact

(Marlboro Clay)  
Nonjemoy

10-21-2

shells (Aquia)

10-21-1

bed with  
Turritella martina

Nonjemoy - yellowish clay with iron concretions  
the size of walnuts. Lower member of Nonjemoy

10-21-4 Fort Washington, Monmouth- DISCARDED

Upper Marlboro  
Md. 202 to car yard

10-21-5 Aquia, 2" below Marlboro

10-21-6 Marlboro clay, 2" above contact.

Addison Road

0.65 miles S. of Central Ave.

10-22-7 Paleocene below Aquia

10-22-8 Aquia, base, just above contact



NAME

DATE

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Jan. 26, 1953

1-26-1 Loc. 1 of Paleocene, approx. same as 12-3-1-1951

1-26-2 Approx. same as 12-3-2-1951

1-26-3 Loc.2. Second creek,  
Cretaceous below contact, 2' to 5' below Exogyra  
associated with well preserved nacreous shells.

Walked upstream to head, saw Exogyra and  
nacreous shells - NO PALEOCENE?



Form 9-076

W.C. Werner

NAME

DATE

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

May 8, 1952

5-8-1

J.B. Knight's loc. 38, 1" to  $\frac{1}{2}$ " yellow shale parting between 2 limestone beds.

12850

see map with x



Form 9—076

Williams

NAME Duncan, Helen

DATE May 9, 1952

U. S. GOVERNMENT PRINTING OFFICE 16—37601-1

Keefer Cr. locality, 100 yds from type sec.  
of Fern Glen

Fern Glen

Bushberg

5-9-2

Shale, 4' - Glen Park

/3+9+3/

5-9-1

16" shale, unknown age

Kimmswick ls. (M. Ord)

River

Park at red house and drop down to river

see Manchester quad.



Form 9-076

NAME

DATE May 9, 1952, p.2

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

Type locality of Fern Glen Ls. Missouri

5-9-3

Red shale at level of power line

5-9-4

Ls. at level  $\frac{1}{2}$  between tracks and ditch

5-9-5

Buff colored above red

5-9-6

Cherty bed , material around chert -DISCARDED



26

Form 9—076

NAME

DATE May 9, 1952, p.3

U. S. GOVERNMENT PRINTING OFFICE 16—37601-1

Catlewood Section  
See Guidebook, Kansas G.S., p.48

5-9-7 Middle of Grassy Creek shale, contains  
Graptolites

5-9-8 Bushberg above 5-9-7 Etched and DISCARDED



Sohn

Oct 1951 - Mar 1954

118

3/21/06

119

3/28/06

120

4/4/06



NAME

DATE May 10, 1952

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

See Fauna of the Glen Park limestone: St. Louis  
 Acad. Sci. Trans., vol. 16, no. 7, p. 435-471, 1906.  
 Goetz Quarry

5-10-3

Bushberg

Bushb.

5-10-2

Glen Park

Glen PK

5-10-1

Shale

Shale

5-10-4

Slab near tunnel from Glen Park just above  
 sandy zone near base

Quarry on hill at 2nd bench group of tunnels,  
 at north end of quarry.



NAME

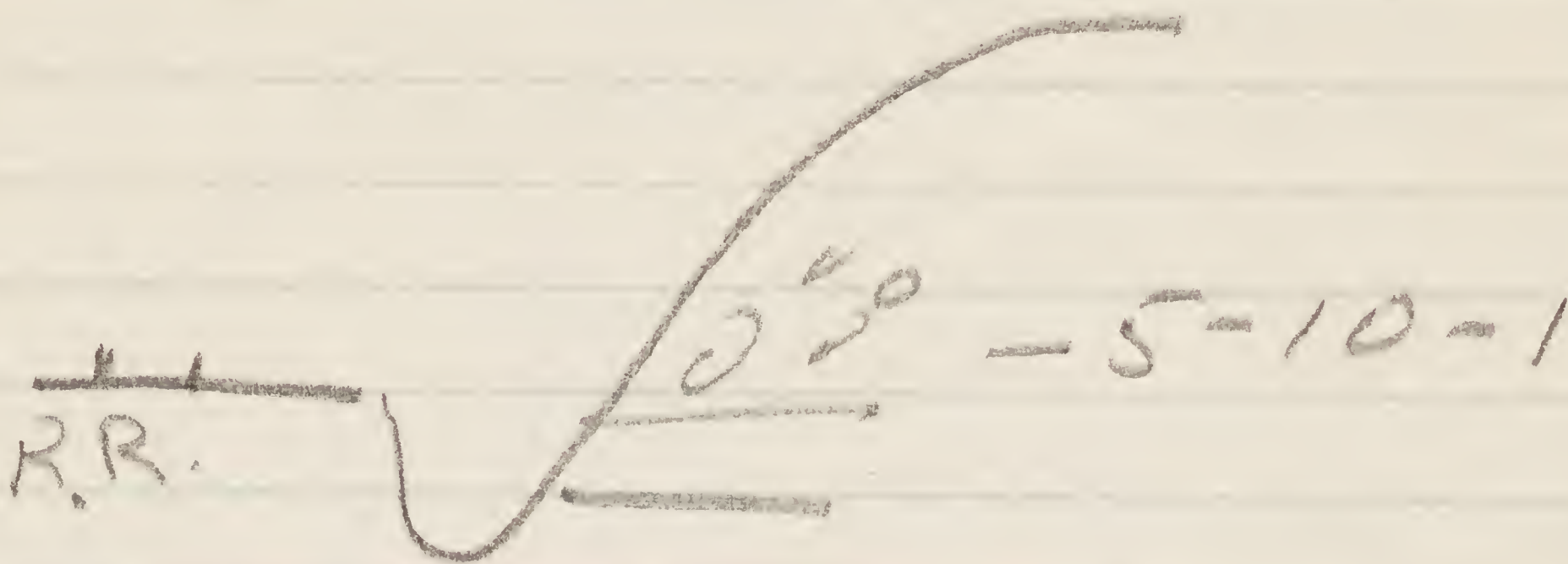
DATE

May 11, 1952

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

5-11-1

S. wall of RR cut due south of Annex "B"  
of the Arena. E end of cut. Probably Knight's  
loc.37. Slump clay with limestone.  
Probably Lower Ft. Scott fm.



5-11-2

35' E of centerline of Driveway, N. slope,  
shale about 4 ft. above curbing & 5' N. of N  
curb. Shale above massive ls. 2' to 3' thick, and  
below thin ls. Prob. L. Ft. Scott, Brill later  
said this is above Knight's loc.

Macklind



29

May 11, 1952

p. 2

(5-11-2)

13000

35' E of Driveway, N. slope  
sh. 4'± above Curbing & 5' N. of  
N. curb sh. above massive ls.  
2-3' thick. and below thin  
ls. Prob. L. Ft. Scott.

Loc.

Macklin Ave. & Wise Ave.  
465' W of Macklin Ave on new  
street which is western  
extension of Wise Ave.  
new slope S of Barena Golf Tee.  
across area of a new bldg.

According to Brill  
this is above Knight's  
Cyclotherm. coal below this  
is above ~~Scott's~~ <sup>Knight's</sup> Ft. Scott.



May 14, 1952

p. 3

(5-11-3)

12851

Hwy 21 & Meramec Riv.  
 J.P. loc. 2 Bryer  
 shale parting about  
 1 ft below top of upper  
Rhinconella zone, and  
 about 4' above Bryer's  
 locality

↑  
 Probably Bryer's  
 locality 5-11-3  
 call. Topotype

See J.P. paper for section



May 12 P1





May 12

p. 1

1939?

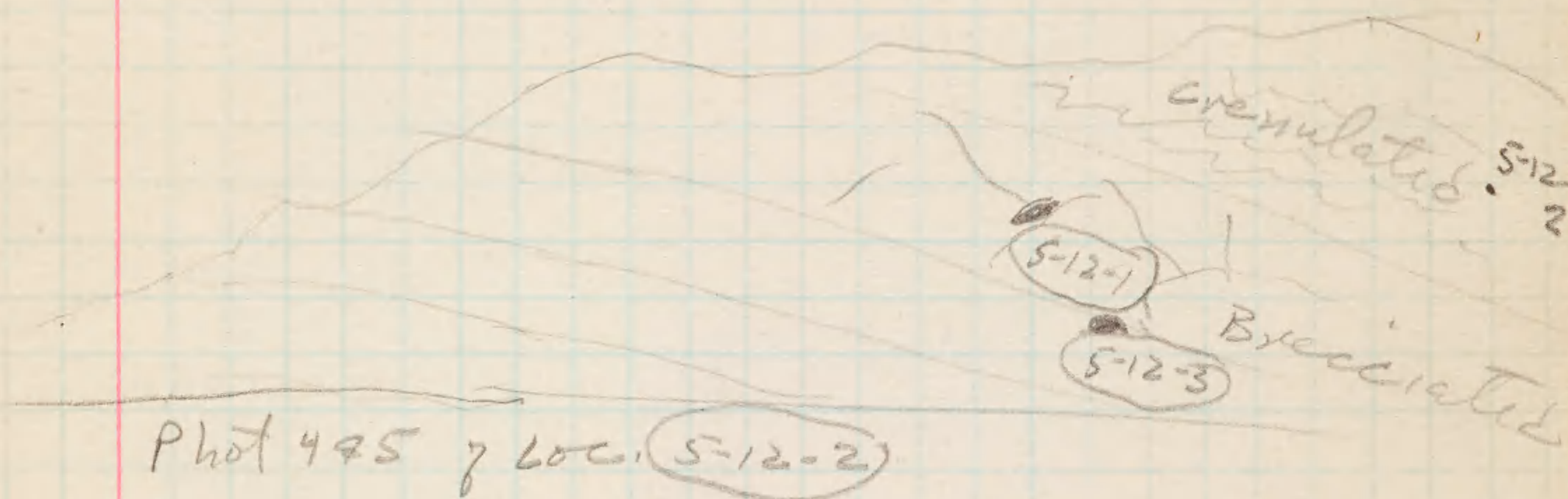
KGS Stop. 24

pp. 52-53

1941

Geol. 15

Roadside outcrop

St. Louis Ls.

Phot 485 of Loc. (S-12-2)

(S-12-1)

Green clay in pockets of brecciated zone

S-12-2

$\frac{1}{2}$ " - 1" seam of brown and greenish clay at rt side of exposure and slab just below clay. 30' left of 1st Tel. pole on outcrop.

S-12-3

Greenish sandy zone 2' below (S-12-1) in brecciated zone



May 12

p. 2

Bob Cr. sec.  
shale under Chontea  
below a slump rock

5-12-5

5/12/4a

Chontea LS (prob. near  
base) slump block  
with shale

5-12-4

Calloway (Dev.) 1' ± above  
base. (at Bob Cr.?)

120  
05/12/4a



Hannibal

30' Louisa - fossils

2' Saverston

3-4" Gray Gt

7" Gray clay shale

2" sand, shaly

24'

Sil Bowling Gr

6' coral

40' Sh.

Magnolia

old.



May 12

p. 3

Guidebk pp. 61-62

Right past the Duval cabins.  
Pinnacle HillOutcrop above  
boat house. (cave.)

collect Saverton

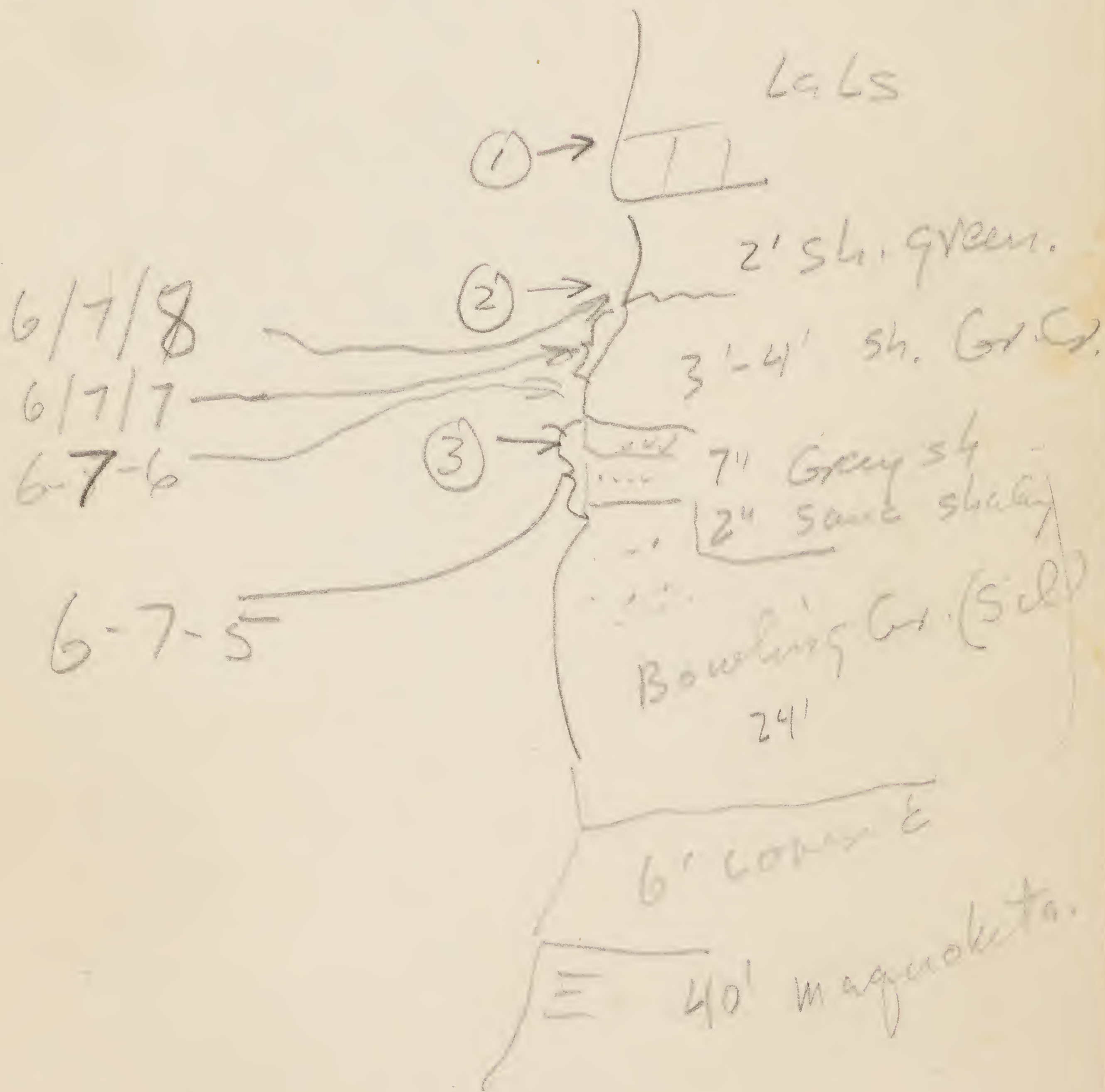
of La. Ls.

5-12-5parting in Ls Ls near cave  
with large brachiopod. 3'-4' above  
base of La. Ls. ↑ SyringothyrisGo to rt of cave for  
bed of Saverton, Grassy Cr. and  
sh. & sand. Sand may be top of Bowling Cr.Saverton really a mudstone;  
Grassy Cr. is a black fissile  
shale.La. Ls. Lowest bed has fossils in  
partings right above and below.Dolomitized portion is yellowish,  
carries calcite.Get picture of La. Ls. in morning  
(over)



Cooper found Ostracodes

- ① La. ls. just above base
- ② Sh. near base of Sawerton
- ③ Sh. at base of Gr. Cr.





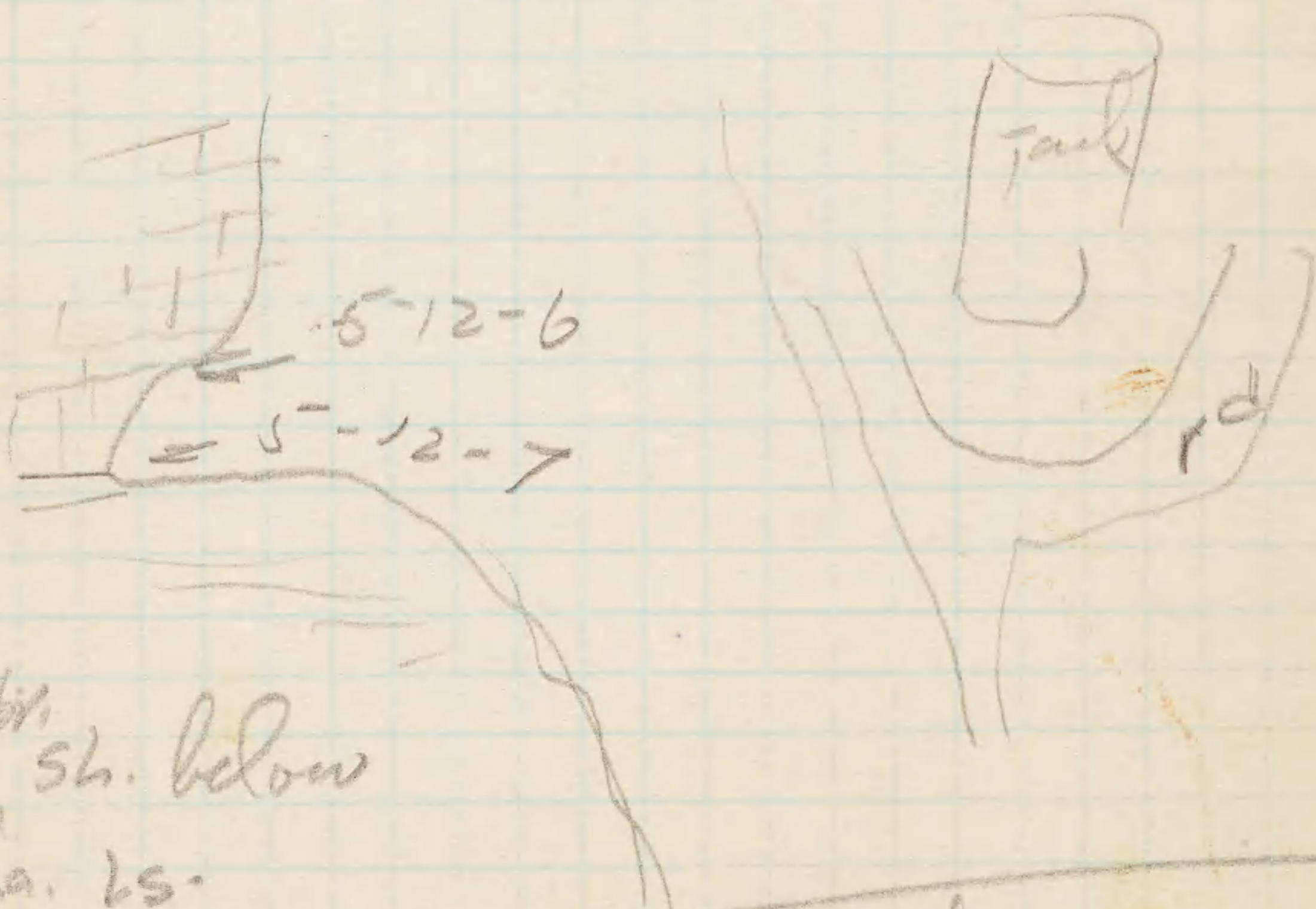
May 1.2

p. 4

Buffalo Hill (Mount Buffalo Cr.  
 (Chad) Guidebook p. 62  
 shale above lower La. bed  
 parting

Stop near gate walk old  
 road to slide  
 Type Loc. 7 La.?

(5-12-6) shale parting  $1\frac{1}{2}'$  above  
 base of La. LS.



(5-12-7) Sh. below  
 La. LS.

Note walk along rd. to place where cars are  
 moved by RR. climb up to basal LS with  
 Greeny Cr. and Saverton exp. make channel  
 and collect



12 1/2  
870



May 13

P2

Town Branch Loc. 7 La. 45  
+ Saverfor

Go N. on 7th To Griffiths  
W on Griffiths To brick pen.  
or to Cr.  $\hat{\wedge}$  2 1/2 blocks

Note Collect

OK.  
June 6

Saverfor and La.

Clinton Spring

Look for ss. at base of Gussyr.

Moix white at base.

Read Gussyr book.

fossil Cr. Cr. exp to rt. of fallen  
block.

La.  
Saverfor < Ostr. 1' below La. 45  
Gussyr Cr. < basal ss.  
Boulding green  
Moix white



return Trip

90.31

outcrop

93.8

93.82

Cross Cr.

1.53



May 13

p. 1

Koderome ~~12~~<sup>13</sup> Rowley's grave  
1/50 belt 5.6 & 8Grassy Creek Type locality  
Cliff opposite Arch Hufford  
Place (see Geol of Pike Co.)Cliff 40' + of shale overlain  
by slumped Louisiana ls.  
(See Bowling Green  $\square$  for  
road)No Dist.  
(5-13-2)

(5-13-1)

Ls. Ls slumped?

2-4' clay  
red br.  
SS. Rd. 6" base  
3' cones(5-13-3)  
Is this Grassy Cr.?  
Kodak 13, 14, 15 ( $\frac{1}{10}$ , 3.5)  
" 16  $\frac{1}{25}$ , 3.5  
17Gray sh. black  
(green) bedding  
surface

Disc.

(5-13-4)

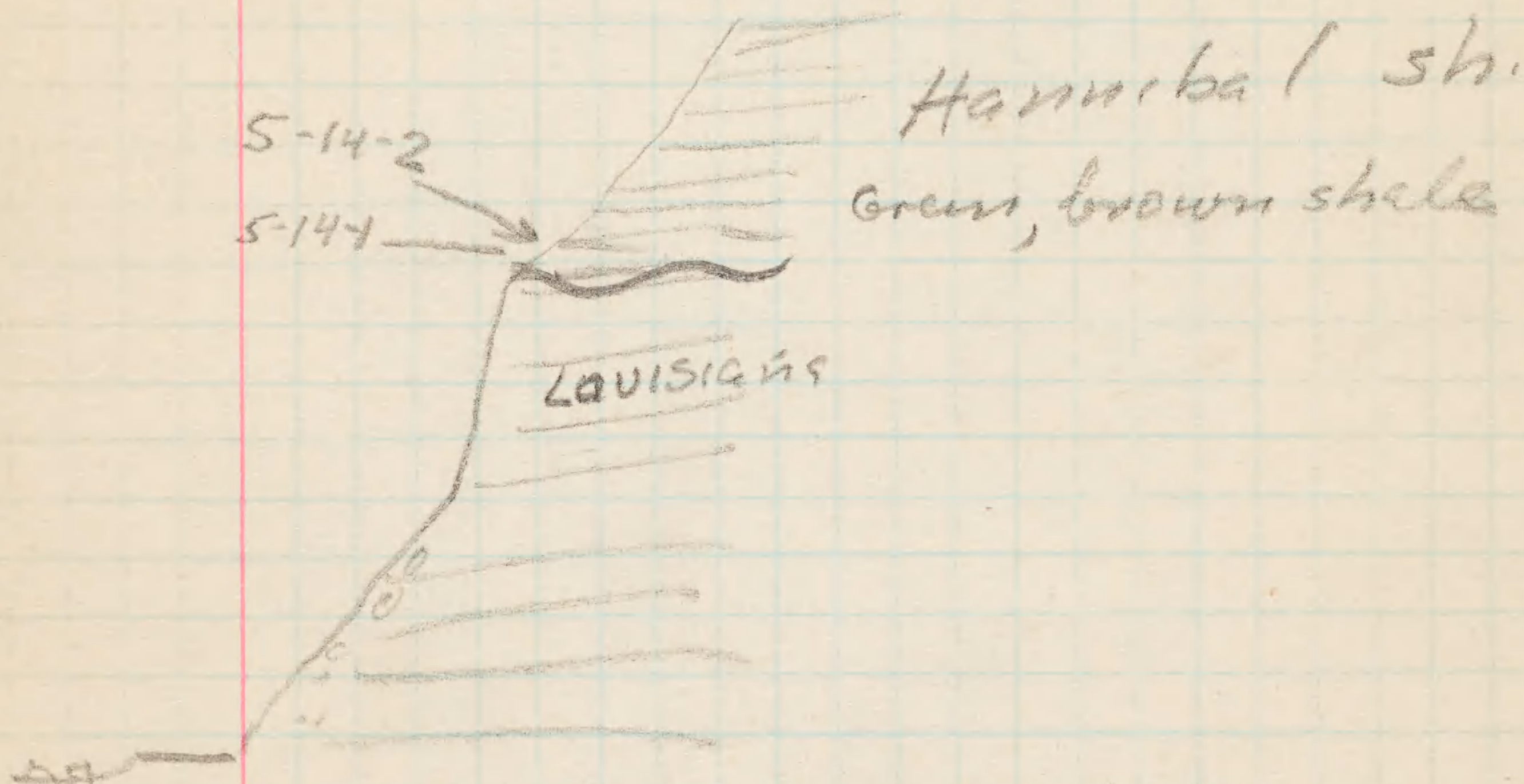
Ls? & sh. below 2/3 down slope  
1 corundum to Huddle 8/14/70



May 14  
Hannibal Mo. Lover's Leap

5/14/1 Hannibal sh. 1'± above  
Louisiana ss. brownish

5/14/2 Greenish sh. just above  
(5-14-1)



Lover's Leap. Hannibal Mo.

Go up Fulton & Cypress or T to  
last house. Vermicular ss. of Hannibal  
make call.

above which is basal Burlington full of  
crinoids called "brown zone" some  
places it is called "sedelia" depending  
on fauna - no Burlington crinoids & Sedelia



May 14

p. 2

Top of Lover's Leap has top  
of Burlington which is white  
ls. with brown layers  
and chert blebs. "There is  
no appreciable shale in Burlington  
overlying Keokuk has shale  
which is greenish in color and  
also more constant chert."

5-14-33

Lover's Leap. Top.

Burlington to L of parking  
area in cliff. rotten zone  
 $3\frac{1}{2}' \pm$  above brown layer  
cherty layers common on  
face.

Kodak  $\frac{1}{50}$  f8 Top Lover's Leap  
Shows br. <sup>ss</sup> bed, chert, etc &  
Top Burlington.



May 14, 1952

P. 3

Birch St.,  
 "Bear" Cr. <sup>Corroco Station</sup> Hannibal Cook  
 House on hill, had quarry  
 behind house La, and Hannibal  
 exposed. *Saw Burlington with  
 chert no lower floor on Hannibal*  
 Tunnel,  
 RR bridge across Miss. River  
 in La. ls., ~~Burlington~~ and Hannibal  
 on Top.

La ls exp. near  
 bridge.

Lover's Leap rd.

Fulton St. ~~2 1/2~~ 2 3/10 miles  
 along River where AA leaves  
 Fulton St. Rd. to Saverton  
 base of LOUISIANA and  
 Saverton exposed. yellow  
 sand below La exposed.

Sample La, & Saverton

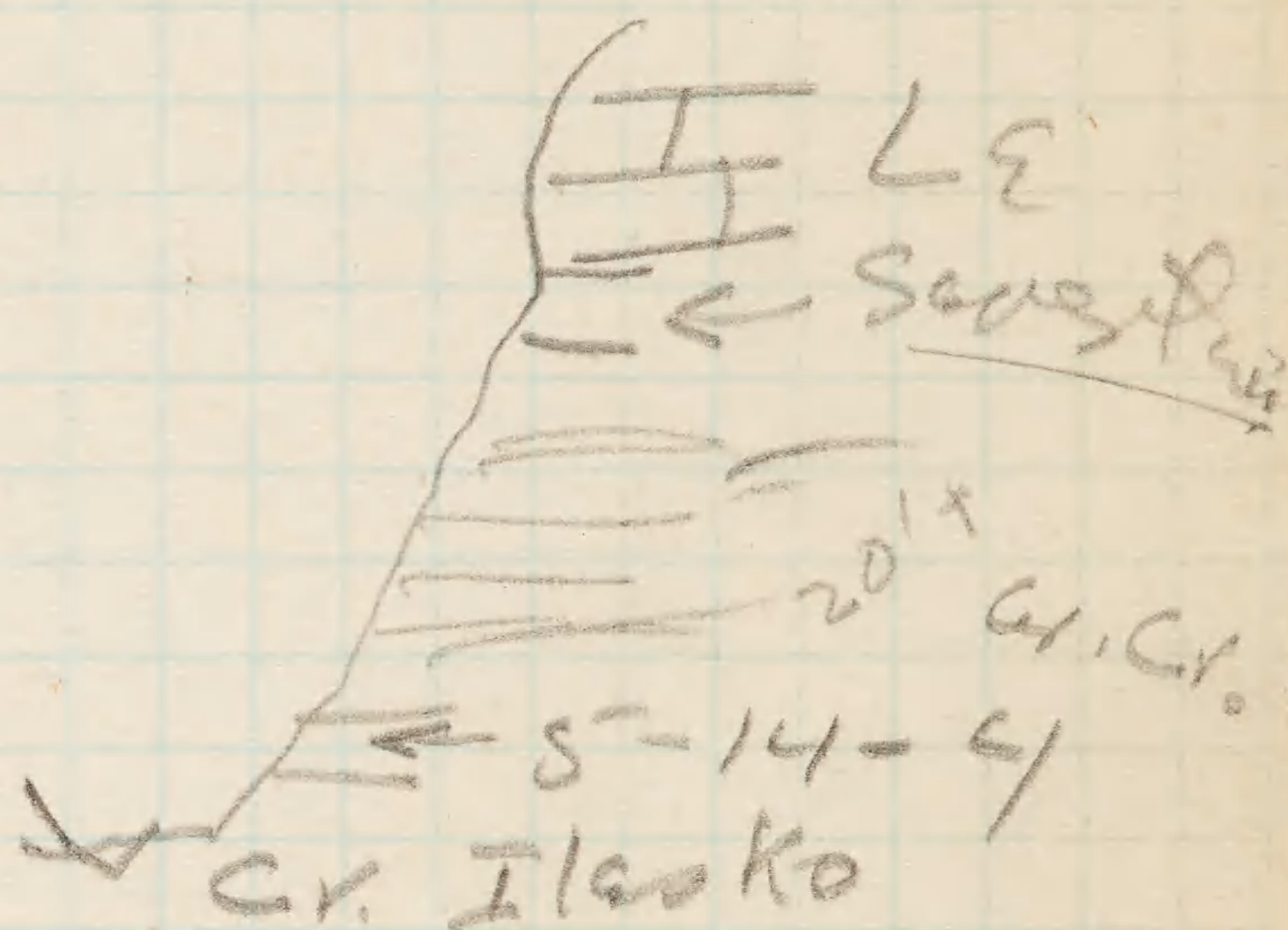
Keep along road 3 miles to Exposures  
 (Try for fossils) none yet found

Keys "60-70" shale near Saverton"

Saverton Station. Burned and moved.  
 Type loc. continue to School Turn rt. to  
 Bridge where Mich Cr. & Malvern Cr.  
 Exposure shale with oolite above (old?), & shale above



May 14, 1952 p. 4

Drive ~~from~~ school. 1.45 miles.

Shale 2'-3' above Cr.

May be Grassy Cr.

5-14-4

first house after Lowe mailbox  
opposite house  
see William p. 31."Hans found better exposure"  
keep on road.1.75 mi. from sch. rd.  
meas. Saverton 4' 9" contact with  
Grassy Cr. exp.Get samples ✓



May 15, 1952

p. 1

Kinderhook Type: 0.8 mi. N of  
Fork. Quarry. Guide Book p. 72-73  
Stop. 37

25' Burlington

10' McCraney

bed 3 in Moore

30' English Riv.

bed 2 in Moore

40' Maple Mill

coll

above spring

E.R. & McCraney  
No obs  
5-15-1  
Disc

The English River has light gray and  
darker gray beds. It is a sandy  
siltstone, fossils not seen. It  
weathers into smooth massive surfaces.

Above Engl. Riv. McCraney which  
looks like La LS. but above McCraney  
is Burlington.

A

Engl. Riv = Hannibal  
McCraney = new LS below Burlington

B.

Engl. Riv = Saratoga (which it  
does not look like)  
McCraney = La  
Hannibal Eroded  
Burlington on top.

Note


The Burlington-McCraney contact  
sharp, no basal ss. or profile

Kinderhook, every day above  
(Grassy Cr.), and below the Burlington



Keokuk is bluer than  
Burlington

5-153





May 15, 1952

p. 2

Continue on rd. 5 mi. go over  
bridge turn rt. cross  
bridge go 0.6 mi. stop  
creek has Seehorn Hollow

Burlington

Prospect Hill 8'±

McGraver

5-15-2

Burlington

massive yellowish  
sandy mudstone

8'±  
25'±

Stammbrook reports ostracodes (over)

Stop 42 pass 2nd bridge

out 7 Vksa. Cherty ls.

Mt. York chert

Guidebook p. 76. saw bryozoa & brachi.

stop 43 Keokuk

Shale parting at base of

quarry below massive

blue bed called upper Keokuk



Merrill A. Stainbrook, 1950  
The fauna and correlation of  
the McCraney Limestone of Iowa  
and Illinois: Am J Sci vol.  
248 March 1950 pp 194-213.

---

Brandon, Iowa.

Sept. 1953 Stainbrook sent  
slide with 2 crushed  
round, smooth valves  
Too high for Cavellina





May 15, 1952

p. 3

Type Warsaw

St. W. 3 School in Warsaw

see Guide p. 77-78 (Stop 44.)

Drive down <sup>1941</sup> to bridge

Drive into field on left of

Bridge just before crossing.

Downstream from bridge

Dolomite with geodes 10' ±  
upstream from bridge sh.geodes filled with quartz calcite.  
Some have liquid inside.

✓ Collect from Warsaw



May 17 1952

p. 1

3 Photos - ledge 47' above  
floor of Quarry (see p. 78)

William's picture of me  
hammer on sh. below ( $3\frac{1}{2}'$ )  
sh. of 5-17-1

probably 834c.

5-17-1  
No Ostr.

Shale 3" below  $3\frac{1}{2}'$   
bed of massive LS.

5-17-2  
No Ostr.

Top 1"-1 $\frac{1}{2}"$  of LS, just  
below shale.

5-17-3

No  
Ostr.

$3\frac{1}{2}'$  below 5-17-1  
thin sh. around chert  
nodule. Place where  
William's took my  
picture E. of 5-17-1



5-17-1

5-17-2

5-17-3

$3\frac{1}{2}'$

14'8"

Plot of



May 17, 1952

see p. 79

0.4 mi. N of Quarry

5-17-4

shale 2-3' above

brown dolomitic ss.

penn

5-17-4

ST. LOUIS?

4' 6"

more exposed  
in Cr. to N.



May 18, 1952

p. 1

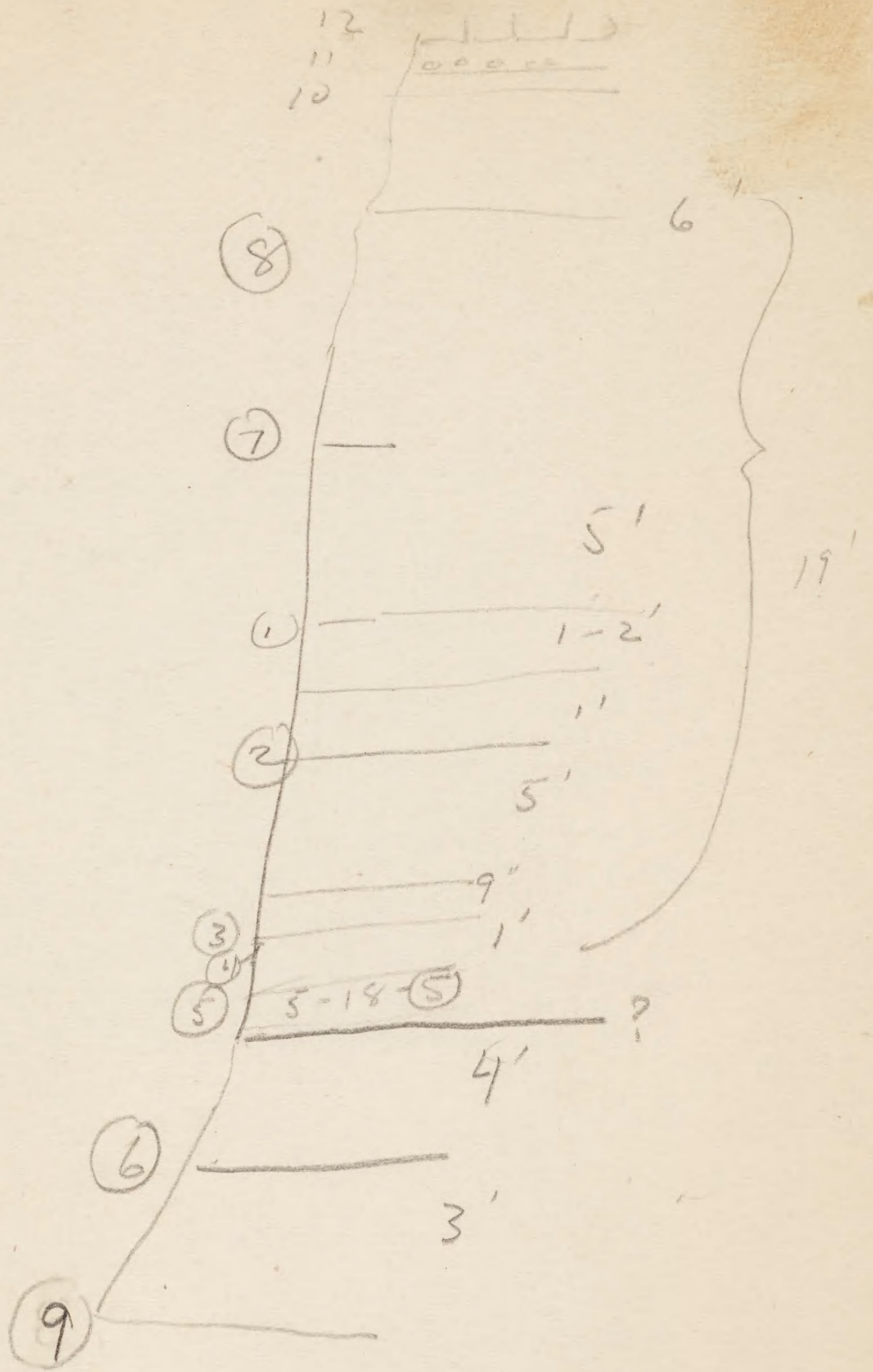
Weller, 1900 Iowa GS vol 10, pp 57-79.

- 5-18-14 7 soft buff gritty ls. 3-5'
- 5-18-15 3 6 white oolite ls 2-4
- 5-18-16 7 25 FG yellow ss, *Prospect Hill* 6-7
- 5-18-17 41 FS. ls. McCraney 12-18
- 5-18-10 3 thin bands hard impure ls  
filled w. chonetes, some with  
thin oolite bedded 1/4 - 3/4
- 5-18-1 2 soft ss. *Chonetes* 25
- 5-18-2 } ① soft blue sh. 60  
5-18-3 }  
5-18-4 }  
-5 }  
-6 }

Local 1-4 section of Burlington  
at Burlington Iowa from  
fishing village, "cascade"

5-18-6  
5-18-9







Cascade Section Prospect Hill Sec.  
May 18, 1952 p. 2

- 5-18-1 1'-2' above base of Chonoplectus ss
- 5-18-2 6"-1' below base of Chonoplect (assumed base.)
- 5-18-3 Brown layer 6" about 5 feet below Top.
- 5-18-4 Blue shale 2"-3" above 5-18-3
- 5-18-5 Sandy zone lower 1'± lower than 5-18-4 has Chonoplectus bed 2
- 
- 5-18-6 brown and blue sh. 4' below 5-18-5  
Ool. Conodonts
- 
- 5-18-7 5' above base (assumed) of Chonoplect. ss.
- 
- 5-18-8 Shaly zone in Chonoplect ss. 6' above 5-18-7  
Conodonts, worm jaws
- 
- 5-18-9 blue shale  $3\frac{1}{4}$ ' below 5-18-8  
Conodonts
- 
- 5-18-10 Weller's bed 3. oolite below McGowaney
- 5-18-11 bed 3 chonetes bed below oolite
- 5-18-12 basal bed of McGowaney just above oolite (5-18-11)  
DISC



Cascade Sec. Burlington

May 18, 1952

p 3

5-18-13

ostr.

oolite, weller bed 6.

5-18-14

ostr.

weller bed 7 3' above  
coll 5-18-13.oolite grades into upper  
bed, contact not visible

left 7 Quarry

5-18-15 oolite

1' - 1 1/2"

1 1/2'

sh. 5-18-16

5-18-17

Prospect Hill ss  
ConcorditeChannel sample  
upper 4' ±

ss. 5-18-17

McCrory

Burlington Iowa

Out Main to

Concord or

next St. turn L.

go down

dirt rd to Cascade. That is Prospect

Hill Section



May 19 1952

p. 1

Sec. at Snake pit, Knox Co. Mo.

Moore 1928 pp. 73-74

Osage

13 Burlington Ls. (Lower)

13 Ls. gray, coarse gr. crinoidal xltene, massive 8

12 Ls. lt gray to brownish, chert, stylolite 5 1/2

11 Ls. br. dol. coarse gr. crin. very massive 5 1/2

Sedalia

10 Ls. lt. br. f.g., massive, dol., porous chert 1' appt 6 1/2

9 Ls. H. gr., &amp; br. f.g. massive 2 chert bands 7

8 Ls. gr. to brownish coarse gr. xltene 3

7 Ls. hard, creamy to yellow, massive f.g. 2

Kinderhook

Chouteau

foss.

6 Ls. H. drab &amp; yellowish br. thin alternating beds. a massive br. ls. near middle 9-10

5 Ls. br. gr., med gr. partly xltene 3-4

4 Ls. bluish drab to br. med gr., argillaceous, scattered patches of xlt. ls. in thin beds. Fossil. 5-63 Ls. wh. to H. gr., beds 2"-8" weathers in shelly frags. very foss 14

2 Ls. yellowish br. arenaceous, thin bedded. 2

Hannibal?

1 Sh. exposed in Riv. bl. to H. green. 1'



Snake <sup>May 19, 1952</sup> ~~pt. 1~~ pt

p. 2

#5

1/25 f 5.6

Picture of upper pt of section

6

Junny

7

Quarry Face left side

Brown fossil. zone

5/19/2



bed 6 of mine

2 fossils

6

alternating beds

Lithogr. ls.

calcite nodules

shale 5/19/1

5-19-2

Disc

Rotten zone in 1' lt. colored dense ls. above Lithogr. ls.

5-19-1

Shale below 6' bed of Lithogr. ls.

5-19-3

bed 6 of mine

1954

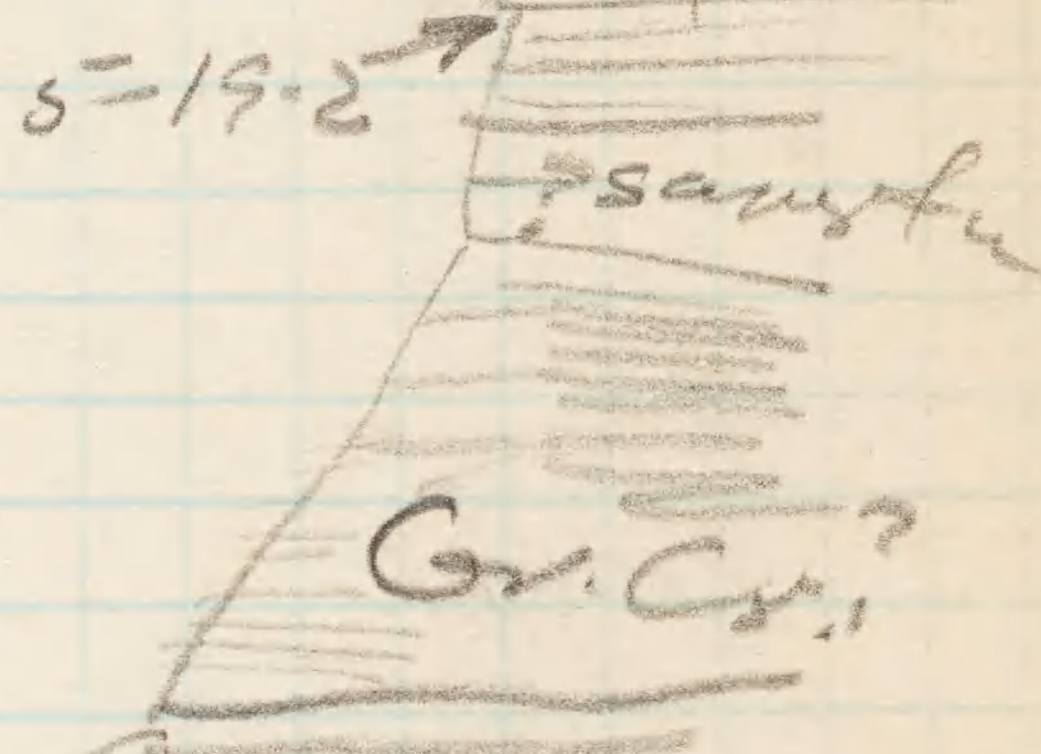
sieved material labelled 5/19/4/5  
is barren - disc., but may  
be wrong date or coll. #



May 19, 1952 sel. p. 3  
 Bellevue Hollow, Nebo  
 S. of Clarksville Mo.

1 mile from H. way  
 just across bridge

S-19-2 brown argill.?  
 mudstone? at  
 base of La. Ls.



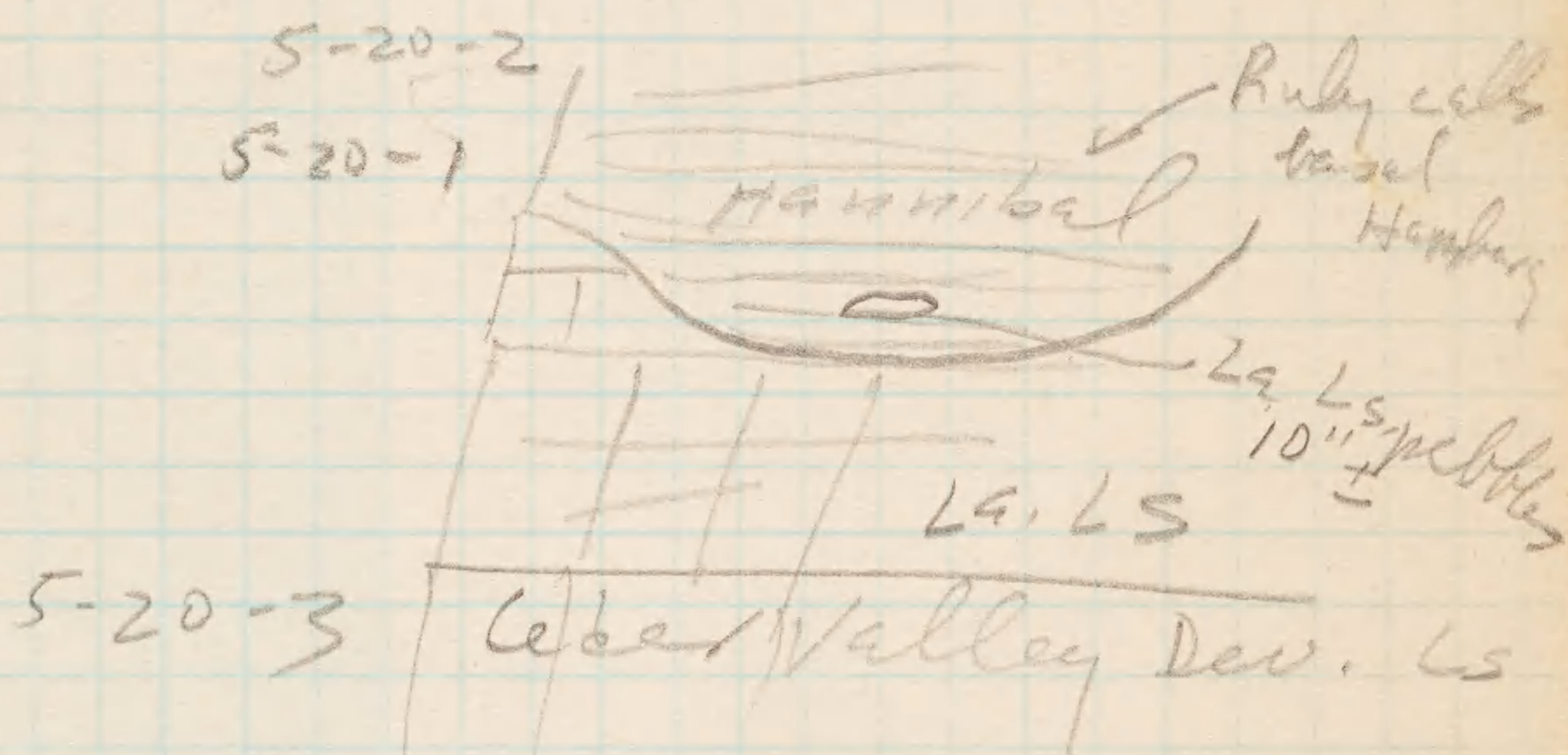
Green clay  
 clay  
 Turquoise?

Go up rd to rt hand fork.  
 continue on Left to farm house  
 Outcrop on rt.



May 20, 1952

p. 1

Hamburg, Illinois  
Methodist Church

5-20-1 basal ~~of Hannibal~~ shale  
member of the Hamburg white  
1'± above Lg. Ls.

5-20-2 3'± above 5-20-1  
Diss. No. 1

5-20-3 Cedar Valley Ls. (Dev.) 1'± below  
Lg. Ls.

5-20-4 Go N. of Town 0.4 mi. at steps to  
river Hamburg white 4 or 5'± above  
base, "shale beneath, rests on Lg. Ls."

Diss. No. 1



May 20, 1952

p. 2

Dogtown Landing

Go S. along water to  
where rocks are flat

5-20" shale parting in St. Louis ls.  
24606-P.C. & ls below parting has corals  
6' above River level (High water)  
about 30' S of fold





May 21, 1952

p. 1

1 mile N of Hardin Ill. Turn L up  
 Poorhouse Farm Hollow 0.7 mi. To waterfall

Waterfall La Grange  
 (Hamburg route)

Covered interval up stream

S-21-1

Hannibal Sh.?, outcrop opposite  
 first (and only) house on rd.

same as S-21-2

may be

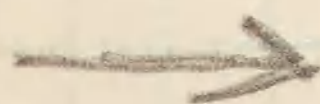
Go up main road 1.25 mi. to

Frenchman Hollow. go up rd. 0.35 mi.

Sh. in place, oolite above shale  
 in boulders that may be float.  
 Oolite up to fence across Cr.

S-21-2

Shale, presumably Hamburg,  
 below oolite.



Get oolite from Williams & Duncan coll



NAME

May 22, 1952

DATE

P1

U. S. GOVERNMENT PRINTING OFFICE

16-37601-1

Guideb. loc. 10

11 Tel. (eleven) Poles gte  
Signal 1640 & 16414 13 Poles after  
Mile Post 164This does not look  
like either Bushb.  
or Gr. Cr.

Chauteau

disc.  
no ostr.

5-22-1

Top 3" of brushb. →

5-22-2

lower 5" of "

5-22-3

Brown sh. containing  
plants 2-2 1/2"BUSHBURG 9"  
2-3"  
Gr. Cr. sh.

5-22-4a Sh. at base 1 1/2' below

5-22-5 Top of harder stuff

No ostr.

✓ 5-22-4 →

Hard Ls. of  
Brown ss 2' max  
Callaway  
Harder more  
silty & laminated



NAME

May 22, 1952

DATE

p. 2

U. S. GOVERNMENT PRINTING OFFICE

16-87601-1

Quarry Guide Steps. 11

5/22/52

No 058

Shale Parting in Charles  
15-20' above floor  
from which Branson got chemo.

5-22-52

~~Disc.~~  
~~No fossils~~Burlington block, rotten,  
out of place with  
macro fossils.

Photo Bl. &amp; white 1-22

3511/15 on horse 1. pt  
of Quarry.Failed to Find Moreys  
Locality 200 yds from  
Early station.



NAME

May 23, 1952

DATE

p. 1

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

Chautau Springs.

Bridge across Cr. Little Chautau.  
Cr. has same ls. very  
few fossils

5/23/1

No ostr.  
Lodovician  
T. Harv.Thin ls. Just below footings  
N side of bridge has  
a bed of 9" below footings  
20' upstream from bridge.

5/23/2

Sandy layer (dolomitic) 6'-7'  
Directly above 5-23-1  
(maybe Sedalia)

5/23/3

10'-15' upstream from bridge  
less than 1' strat. above  
5/23/1

5-23-4

25' or 30' above bed of Cr.

No  
ostr.

Burlington center. on rd.



May 22, 1952

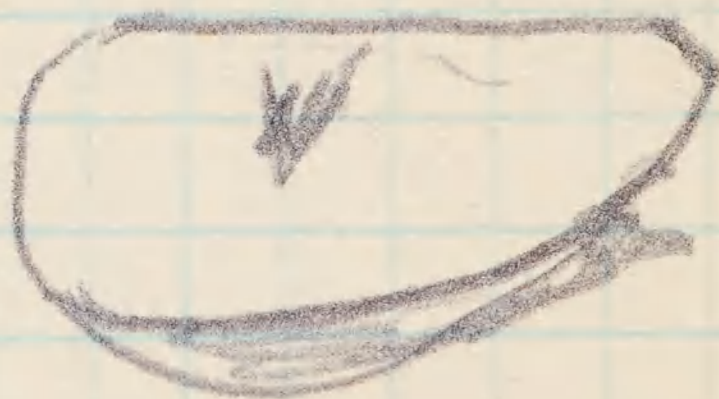
*Hypotetrasona imposita* Morey 1935  
 placed in Cytherellidae,  
 probably Kloedenellid

Plazionephrodes 05-1000-5 U Macell  
spec. bone

Morey's Thesis Pl. I has 43 figs  
 pp. 15-16 Kirkbyina quadrispinosa  
 + Pl. I figs 13, 14  
 Good & Coryellina.



13



14



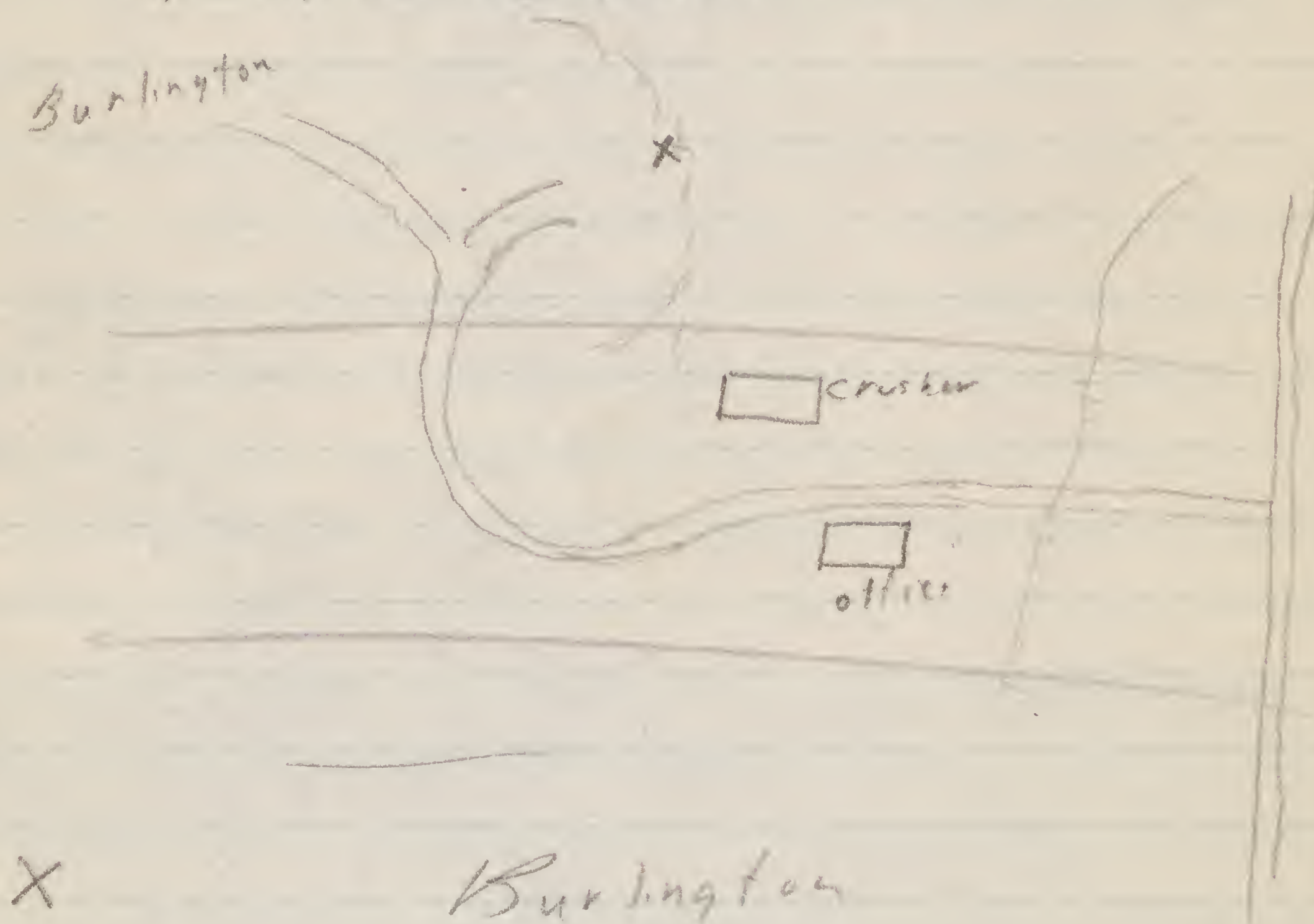
NAME

DATE

U. S. GOVERNMENT PRINTING OFFICE 16-87601-1

Turn N at Kingston City on 54  
 Cross Duckvass Cr.  $\frac{1}{2}$  mile  
 rd to Quarry. NW  $\frac{1}{4}$  SW  $\frac{1}{4}$  Sec 35  
 T49N R9W.

Burlington



ss. Bushberg - 4" - 10"

7-10

Greenish Shale - Snyder Creek

20'

Dev Lms. Callaway (Idiastromes)



NAME

May 23, 1952

DATE

p. 2

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

Hamm's Prairie on  
Rd "C" from Fulton  
Valley along rd. mi.  
From Hamm Prairie

cut shows ch. and  
yellow sh. and clay mixed  
with ss. & ls. cobbles  
may be Snyder Cr sh.

5-23-5 sample of  
Sh.?

5-23-6 Snyder Cr. sh.  
(macro fossils) on

smooth slope higher  
and 30' ± upstream of  
5-23-5.

5-23-9 Bushberg sand.  
go up hill above drain  
pipe to recent point under  
Bushberg Toss. white sand  
mixed with yellow clay  
Watch for contamination



NAME

May 23, 1952

DATE

p. 3

U. S. GOVERNMENT PRINTING OFFICE

16-37601-1

Gravel stops 14

Smider Cr. sh. at roadside

muddy gunk with ls.

nodules. 5/23/7

12853

Gravel & Nodules -  
 Watch the bags - it  
 may be contaminated  
 with overlying ferrous.

5/23/8

Callaway below 5/23/7

5/23/5

See p. 2

Bushberry mixed with  
 clay watch for contamination,  
 over 5/23/7



May 27, 1952

p. 1

Castlewood Section at  
milepost - 2220 (over)

5-27-1 6" of brown sand, prob. base  
of Fern Glen or Top of Bushberg.  
The same layer extends to  
rt. over outcrop as a green  
reentrant. more than 1' thick

5-27-2 3" sandy layer 2' above base  
of 5-27-1 (Fern Glen)

No  
Ost.  
Discont.

The base of the Bushberg  
is roughly 8' below 5-27-1

5-27-3 Bushberg 3' above base  
No Ost.

5-27-4 2" Bushberg just above  
6" phosphatic zone which is  
the base of Bushb.  
Elev. nothing  
no Discont.

5-27-5 Basal 3" of Bushberg, phosphatic

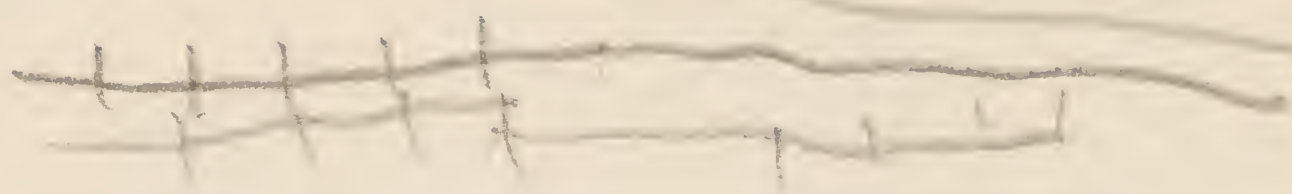
5-27-6 Top 2" of Gr. Cr. just below  
Bushb.



River

mulepost

0  
2220



0  
calvert

Slope of overtop





May 27, 1952  
Castlewood Station -

p. 2

5-27-7 3" of cgl. below shale  
Stenokeras & Gost. Pel., ostr. & Yodulson

5-27-8 basal 1" shale layer  
Gr. Cr. just above  
phosphate bed

5-27-9 Gr. Cr. Sh. 1' above base.

5-27-10 Gr. Cr. Sh. 10" to 1'  
below top.

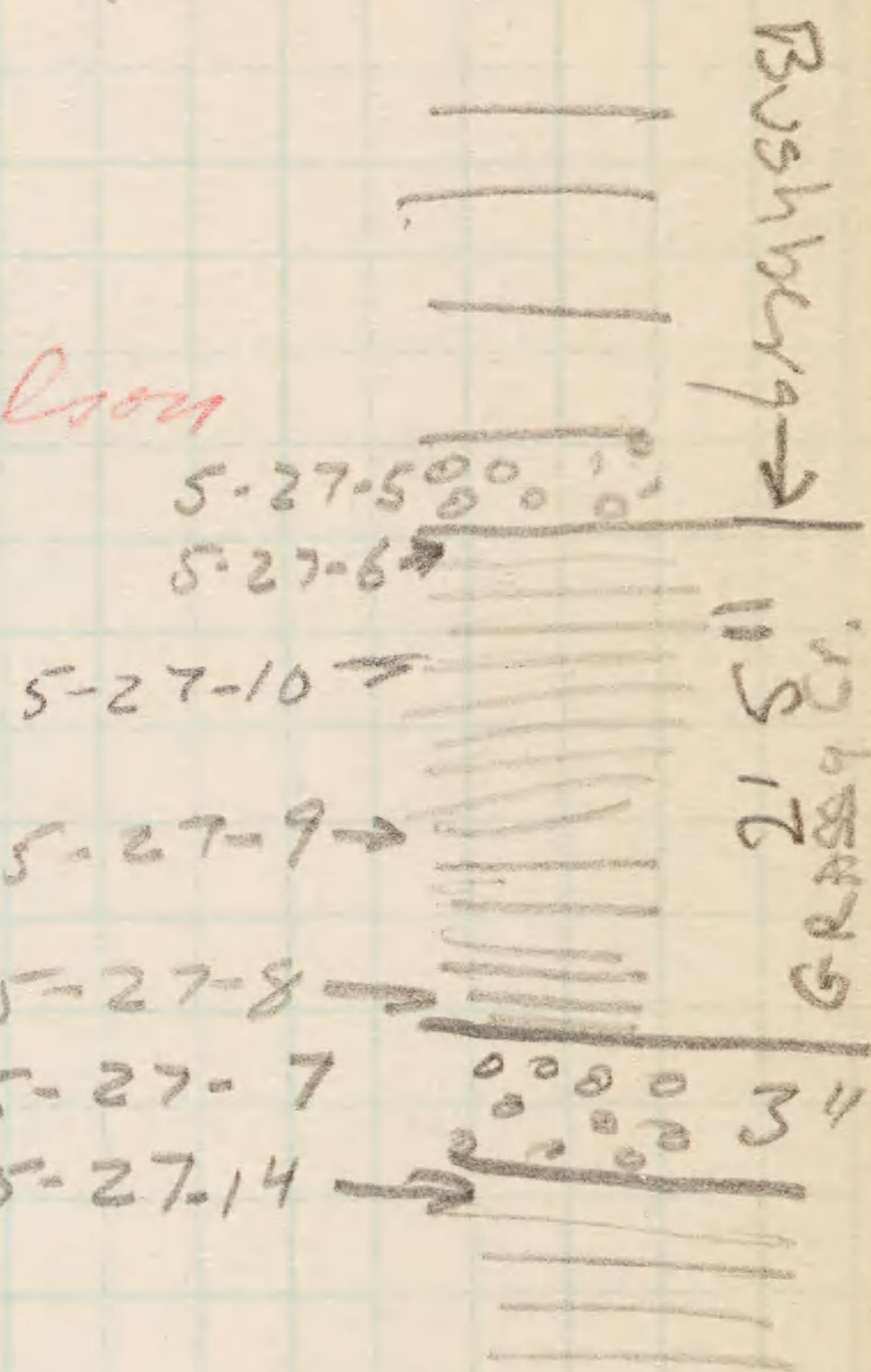


Fig. 7.

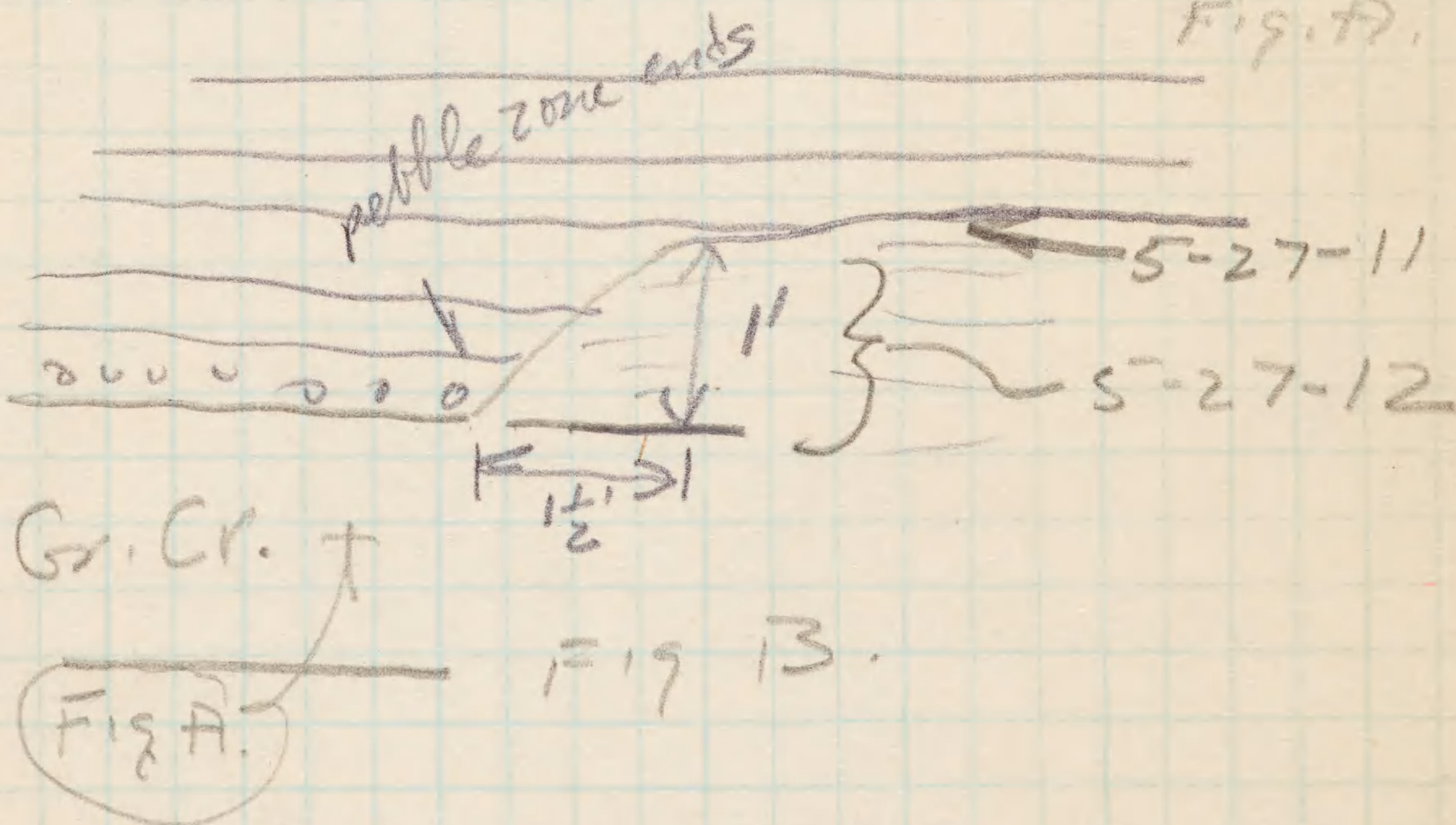


Fig 13.

5-27-11 Top 3" of sh. Sample discarded  
poor ostr.

5-27-12 Channel sample of entire pt. 2  
sh.

5-27-13 Magnoketa, Channel sample 2 1/2' to 4'  
No ostr. below base of Gr. Cr.

5-27-14 top 4" of Magnoketa No ostr.



64

May 27, 1952

p. 3

5/27/52  
poor ostr.  
snail  
worms

Castlewood

Magnolia slope 10' ± below  
top. Taken 3 Top material  
to catch the ostracodes.

---

Rolls May 28



May 29, 1952  
Goetz Quarry

p. 21

from Weller 1906 pp. 435-436

- |    |                         |      |              |
|----|-------------------------|------|--------------|
| 11 | Burlington              | 18'  |              |
| 10 | Xlle Green Gray ls      | 7'   | 3 chert beds |
| 9  | Red ls Fern Glen        | 8'6" |              |
| 8  | Shale & red calc.       | 6'   |              |
| 7  | Xlle yellow to gray ls. | 4'   |              |
| 6  | Bushberg                | 14'  |              |
| 5  | Sandy sh.               | 4"   | ← look for   |
| 4  | Glen Pk                 | 1'3" |              |
| 3  | Maguoket                | 4'   |              |
| 2  | dark ls                 | 1'6" |              |
| 1  | Kimmswick               | 55'  |              |



May 29, 1952

Gue's Quarry

5-29-1

1" to 2" shaley clay, green  
and brown between Bushb.  
and Glen Pk. May  
contain spalling of Gl. P.  
and overlying Bushb.  
Wells bit (5)

5-29-2

a pocket 4" to left  
5-29-1, apparently the  
same level, but probably  
not contaminated



May 29, 1952

p-3

Wellers bed 3

- 5/29/9 Glen PK Ls. upper portion, just below 51 1/2' + secondary?
- 5/29/8 Top 3" just below G.P. secondary?
- 5/29/7 Lower 9" of shales, gr. br. yellow mottled clay
- 5/29/6 1' channel dense yellow brown siltstone black carbonaceous specks
- 5/29/5 9" same as below channel
- 5/29/4 3" sand clay with Ls. at base rare cstr, snails
- 5/29/3 6" mottled red and yellow clay with nodules of ss?

1' dense yellow siltstone  
 11' 0" dense yellow siltstone  
 9" same as below  
 3" yellow clay Ls.  
 6" sandy clay

Ls.

5-29-10 basal 1" + of Glen park. Unzoned from overhanging ledge.

12854



May 29, 1952

p. 4

road from Goetz Quarry  
to above RR cut

5-29-11 red shale in  
upper part of Forinkookuk  
Burlyton <sup>above</sup>  
nonfossil. massive  
Tan LS with  
Chert bands  
\* 1" in thickness

No  
OSH-The massive material has calcite  
nodules.



May 29, 1952

10:5

lot less  
low

3 mi ± E of Pacific

Go Hway 66 to sign Fox Creek

Rd. turn N. NW 0.7 miles

outcrop of ls on rt. side of road

Curtis C Fleming "Ost. Platin" type section  
within 8' of above top of Joachim fm

5-29-12 9"± shale in Platin

according to Pappas near Top of Platin  
contains ostracodes5-29-13 bottom 2" of 5-29-12  
rare ostr. conodonts.

5-29-14 top 1"-1½" of 5-29-12

5-29-15 bed below sh.

5-29-16

To Hammer

3"-5" bottom pt of  
overlying ls  
which weathers like  
Kimmerwick

5-29-15 →

dithosv. ls

gray

5-29-16

sh. 9"±

Massive ls

layers 6"-8"

with sh. partings  
drab colored

B+W photo roll 2#s

Pappas at outcrop

Hammer below Shale



May 30, 1952

P. 1

Clark Locality for silic. Platin

US 30 E of Hound Springs

To High Ridge or  $1\frac{1}{4}$  mile W of High Ridge - Hill on which home "Shangri-La" is located  
 5-30-1 platy ls. 1'± weathers tan above massive brownish weathered ls. 2'±. platy ls has sparse weathered fossils to many fossils

5-30-2 Very foss. layer above platy ls like ①  
 To G.A. Cooper non foss. 2 chunks inked.

5-30-3 Greenish sh. below ls 1"-2" at ③ No ostr  
 Disc

5-30-4 1"-2" ls. above sh.

5-30-5 lower 2" of 1'6" shale above 5-30-4

5-30-6 1/4" ls, 1" sh, 0 and 1" rotten? ls? below  
 ls. and top of 1'6" shale layer of 5-30-5.  
 do ls, separate

5-30-7 ls. above 5-30-6 basal pt  
 may be with 5-30-6

5-30-8 6" layer 2' above 5-30-7, ls. foss.

5-30-9 massive foss. ls. 8'± above  
~~5-30-8~~ 5-30-8, top of hill  
 ls. 2'-3' thick sample from  
 Top 6"± Opposite pole A.  
 of Schedule.

Hill below "Shangri-La" home, 1 mile west

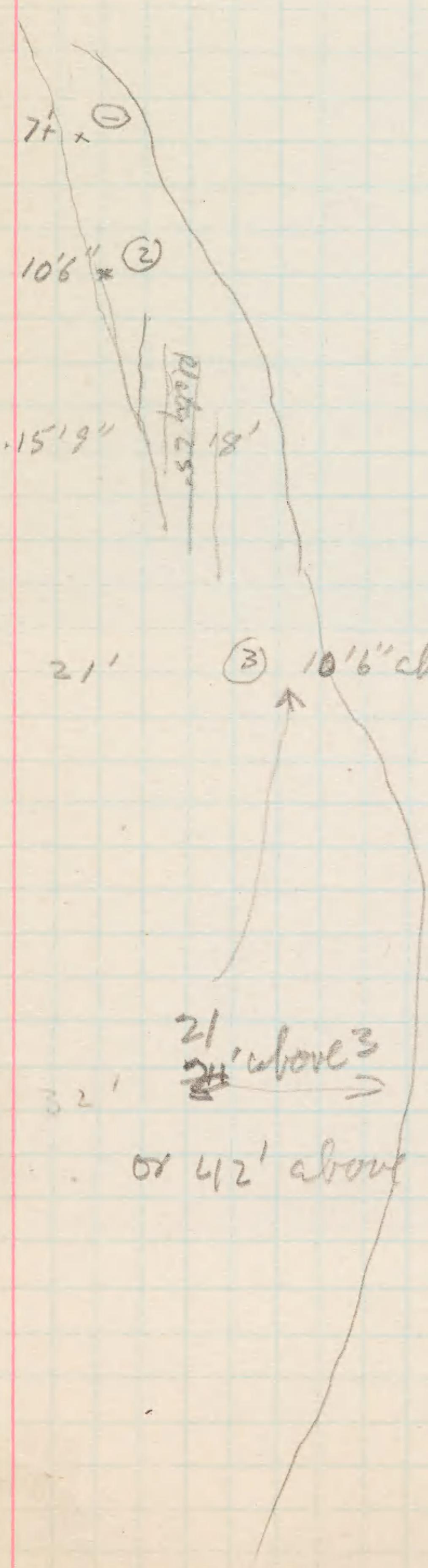
Bama  $\nearrow$  Cafe  $\frac{1}{4}$  mi W of High Ridge.

Shangri-La owned by Brown of St. Louis.



May 30, 1952

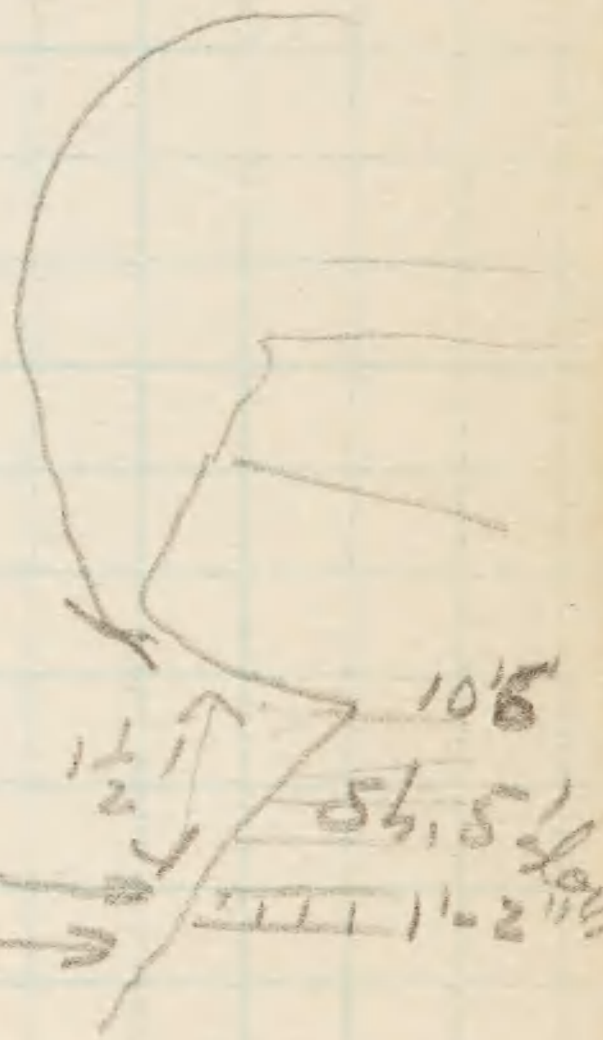
datum  
N-side Hwy 60  
opposite pole & tree  
near end of guard fence.



5-30-8 { 6"  
2'

5-30-7 1' { Tan  
LS  
unfoss.

5-30-6 { 0000  
1'  
1'  
1'  
1'  
1'



5-20-4  
5-20-3

21' above 3  
5-30-9

or 4 1/2' above datum

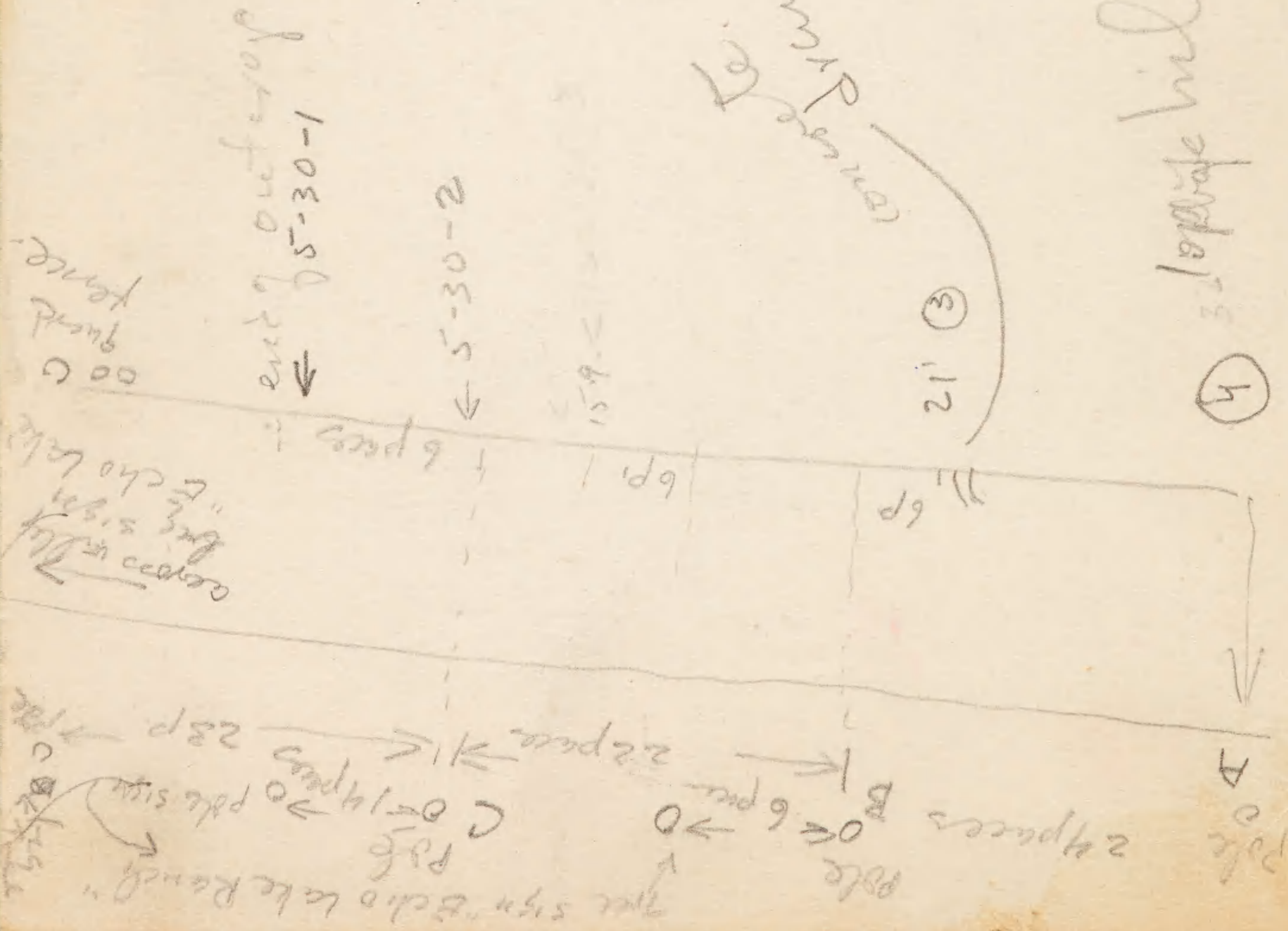


May 30, 1952  
 Platin on Hwy 30  
 see pp 1, 2 & May 30, 1952

Stef Decors  
 shale sequence  
 in Decora, not  
 Platin "Werner"

conductor from no.

3. lopape hill 5-30-9





S	T	W	Th	F	S
Fun 2 place 25 impulse	parking 26 Brill.	27 Castle wired	28 Rolla.	29 Glass PK Kebokuk	30 Platin Fernola
Reports 1 ✓	Keyes pt. Cr. Cr.	pt. Cr. 3 ✓	SHIP ✓ Go La. Buff. Cr. ✓	Buffalo ✓ Helf ✓ SV ✓ LOUISIANA	Gassy ✓ Chickadee ✓ Tupper ✓ Turn ✓ BV
Gassy Cr. Magnesium Wiping ✓	Typical Salvage ✓	Hammill Ship Top Mar. ✓ Camp ✓	Salvage Helf ✓	Warr ✓ 12 ✓	Bellevue 13 ✓
Lovers Leap 15 Ship	Monroe City 16	Save to rd. ✓ 17 Kebokuk	Soap Cr. 18 Kebokuk	Quarry F/17 19	Soap Cr. 20

4-8 World House  
 9-15 Hammill Gen. Del.  
 16-17 Hammill  
 18-20 Kebokuk  
 21-23 Urbans

Augustin Montano State Hosp, Montano, Ill.  
 SESW 11T 12SR 7E 1/2 min  
 7 Eichen Hord in Ca  
 R. ...  
 6/4/after ship  
 wt 71 F 1900  
 R 1750



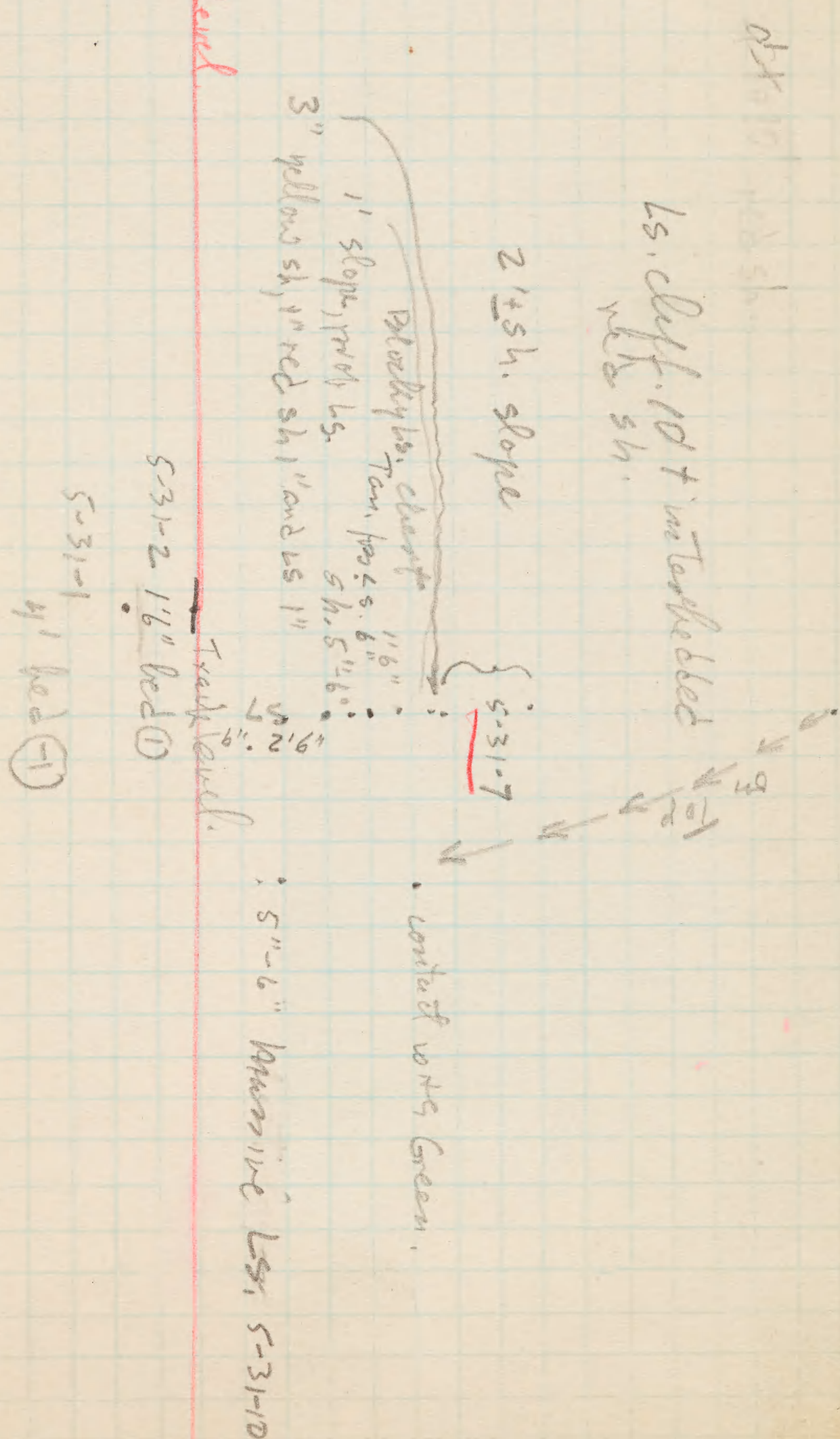
May 31, 1952

Type Fern Glen

↑ Rockland

scale Vert 1 sq = 1' 1 sq = 10' = 2 paces

Sta. A. Sta. B. Sta. C. pole B. pole A.



End outcrop



May 31, 1952

p. 2

Type Fern Glen

Bed ① 1'6" massive Ls. with layers of chert nodules 3"x6" to 2"x10" and smaller.

Bed (-1) 4' massive Ls.

5-31-1 upper 1'6" of bed (-1) Station A

5-31-2 Bed 1 chips Station A rare ostr.5-31-3 6" above bed 1 chips Station A rare ostr.

5-31-4 3"± of shale 3' above bed ①

19579? red brown with streaks of green green about 1/2" at top Sta. B.

5-31-5 6" Ls. green spirifer, basal 2"± Sta. B.

5-31-6 2' above 5-31-4 3" sh. and Ls. bottom 1" yellow, next inch ± red, next inch Ls. Sta. B. ostr.

5-31-7 upper 6" of red shale Sta. B.

The contact of green and red is a zone chert nodules, nodules in red zone also. 2' above contact at Sta. C. is a 6" bed of chert and cherty beds continue up.

5-31-8 green sh. above contact Sta. C. 1' to 1'6" below massive chert.

5-31-9 O.H. red sh. and Ls within 1' below contact with Gr. Sta. C.5-31-10 DISC massive Ls. 3' below contact with Gr. Sta. C.~~5-31-11 Sh above 5-31-10 Sta. C. Lost.~~

Kodak roll 2 film 9-13 Fern Glen Type, 13 bed ①

B &amp; W film | werner, Middle Fern - "sedative"



Cott. W. 3 mi. →  
Cross Rd. Inn

71.45

all but

69.3

69.23

69.15

Since  
Linden Bn  
to collect

Sign

68.8

68.51-

Main

Private

from Glen

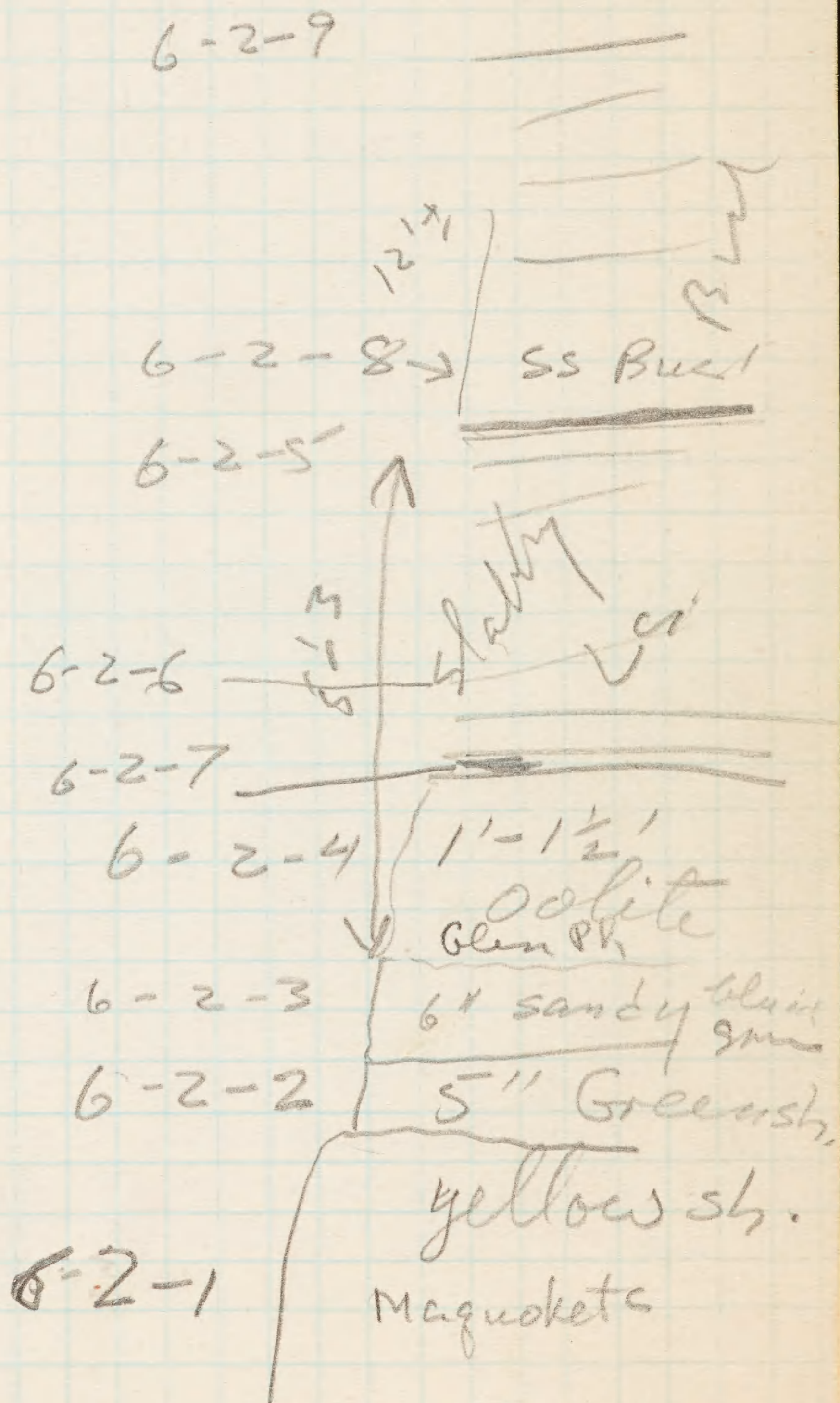


May 31, 1952 p. 3  
Log from Fern Glass.

- 68.51 Private rd. junction with main  
Turn Rt. 5 letter boxes across rd.  
Grady } first 2  
RW Hopkins } letter boxes
- 68.8 Bridge and rd. to 6 coming  
Sign castlewood point l.h.  
Lincoln Beach.
- 69.15 Bridge Turn left
- 69.23 Castlewood Acres. x rd.  
Turn Rt.  
Stop at Bill Breit for pepsi  
rd.
- 69.3
- 69.4 Mobilgas st. on rt.
- 69.8 Log cabin on rt.
- 71.45 x rd.
- 72.2 main Hwy Turn Rt
- 72.25 City limits Baldwin
- 72.35 Bridge
- 73.55 Crestwood manor gate on L. side
- 73.8 end Manchester begin Baldwin.



June 2, 1952  
 Keefe Cr. Section





June 2, 1952 K-2

- 6-2-1 yellow shale. magnesian
- 6-2-2 Green sh. 6" just below  
SS?
- 6-2-3 6" green and blue mottled  
undurated phosphatic ss?
- 6-2-4 Glen PK oolite channel  
of lower foot.
- 6-2-5 Glen PK 5'± above base slabby  
ls. Top Glen PK  
slabby ls 1'± above oolite  
shale between.  
Wash both separately
- 6-2-7 sh. parting above Glen PK.  
massive bed and below 6-2-8
- 6-2-8 Base of Bushberg
- 6-2-9 Bushb. ss. 12'± above base

No ostr.  
disc.



June 2, 1952 3

Fern Glen RR cut

6-2-10 Grab sample of Talus  
of Fern Glen.

Go past RR Track

6-2-11 blue 1' above red  
either Fern Glen or  
trans. with Burlington

---

Castlewood6-2-12 Pyritized zone 1' ±  
below Top S. of milepost  
22 206-2-13 Fern Glen near Castlewood Steps  
Lower green sh. above LS

6-2-14 Red Fern Glen above green

6-2-15 of 6-2-13  
LS 2 1/2' below 6-2-13



June 2, 1952 p. 4

6-2-16 Burlington rd. from Castlewood  
reading 54.65

54.7 Lincoln Beach Road

Out crop E of road

56.6 Hwy 50.



1900

Front

1750

Ree



THERE • IS • NO • SUBSTITUTE • FOR • QUALITY

Glencoe #

Holcrest

Platt<sup>cat</sup> in

slabs  
silicified  
fossils

Eureka #

178 - 192 E. NINTH STREET ST. PAUL, MINNESOTA

LITHOGRAPHERS

PRINTERS

CO.

SMYTH  
PRINTING

GA REL 5891



NAME

June 3, 1952

DATE

p. 1

U. S. GOVERNMENT PRINTING OFFICE

16-87601-1

Paint Cr. Loc. Illinois with  
Prof. Werner

07.4

Millstadt Illinois Main Rd.

08.4

Turn S. (rt) on S. Jefferson

Take rt of Y fork  
Winding rd.

9.6

side rd. left. Go straight  
on winding hill

10.9

~~side rd. left on T rd.~~  
road turn left

11.2

Jog rt

11.4

side rd. left. Go straight

12.2

Jog left

12.3

Jog right on T road

13.3

iron bridge.

13.35

side road rt. go straight

13.85

turn left on Vogel to Schall

continue

14.0

school house

14.55

bridge

cross bridge on left  
drop to creek



NAME

June 3, 1952

DATE

U. S. GOVERNMENT PRINTING OFFICE

16-37601-1

Paint Creek, 2

6-3-1  
Ostr.

Shale just above creek level

6-3-2  
Ostr.

Ls. 5"-6" with shale between

6-3-3

Sh. above 6-3-2 4"± has blastoids

6-3-4

Ls. 6"± above 6-3-3 looks like lens

6-3-5

Shale 6'± above base below Ls. nodule.

6-3-6

Grab sample same level to 2' lower than

6-3-5 →

↑ 6'± 8'  
shale to top

6-3-5

6-3-4 Ls 6"±

6-3-3 Sh. 4"

Ostr.

— 6-3-2

Ls. { 5"-6"

Ostr.

6-3-1

Sh. 3"  
Ls



NAME

June 4, 1952

DATE

p. 1

U. S. GOVERNMENT PRINTING OFFICE

16-37601-1

Buffalo Creek, 2 miles S. of  
Louisiana, Mo.

Walked road skirting the south  
side of Buffalo Cr. The road  
has a gate across it on W. side  
of Hway. Walk to end of hill  
on side of which Louisiana Ls.  
crops out. Ledges of massive  
Ls(?) crop out on rd. then an  
old rd takes off to left of  
wagon rd. This rd ends in  
water course. Walk up ravine  
to plateau above Louisiana Ls.  
No outcrops. Retrace steps to  
westernmost outcrop of Louisiana  
Ls. This is near the top of La. Ls.  
One bag and one slab of fossiliferous  
brown Ls(?) about  $1\frac{1}{2}' \times 2'$  thick  
with small pebbles. About 2' below  
this zone is a calcite bearing  
zone.

6/4/1

ESTR.  
6/4/2

6/4/3  
ESTR.  
6/4/4

Walk back (E) to next outcrop  
of La Ls with slide below it uncovering  
underlying sh. 17' layers or 870' from top  
2 bags of clay partings above  
basal 1' of Louisiana Ls.  
1" x 2" of clay just below La. Ls.  
Black sh. (Saverton?) just below  
clay of 6/4/3

6/4/1952



NAME

June 4, 1952

DATE

p. 2

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

By use of pinch bar I removed approximately 3' x 2' of lowermost bed of ls ls. and scraped the clay partings above this bed and above 6"  $\pm$  bed overlying basal bed. This clay should have a minimum of contamination and is coll. 6/4/2.

Removal of lowest bed ls ls revealed clay below ls ls which was collected as 6/4/3. This may be slightly contaminated from above.

Scraping away overlying clay I collected top 2"-3" of black shale as 6/4/4. Although care was taken, it may be slightly contaminated with basal clay of 6/4/3.

Will return to-morrow for more samples



June 5, 1952

p. 1

Buffalo Cr. S of Louisiana

870'  $\pm$  WD of gate at Hwy 79  
slide exposes basal Louisiana ls  
and underlying shales. Same stop as  
6/4/52

6/5/1

Beal 2"-3" of yellowish clay  
shale

6/5/2

scrape off yellowish clay  
to clean area of black shale  
and sample black shale,  
top 3"  $\pm$ 

6/5/3

partings above basal bed 1'-1 1/2'  
of Louisiana ls.

6/5/4

black shale (Gr. Cr?) 6' below  
La ls.

6/5/5

Bl. sh. 3 1/2'  $\pm$  below La. ls.  
Broke shovel. —

6/5/6

Basal 1 1/2' of La ls. macrofossils,  
use for dating  
No Ostr.



June 5, 1952 p. 2  
E. scarp of Hill on S. side of  
Buffalo Cr.

Upper foot of Saverston hard,  
with conchoidal fracture,  
more like mudstone.

6-5-7

Upper 1'± of Saverston

6-5-8

Channel sample of 1'6" of  
greenish sand bluish  
softer clay shale  
Non fossiliferous, prob. Saverston

6/5/9

Top 4'± of black  
fossiliferous shale.

6/5/10

basal 2" of Gr. Cr.

6/5/10

6/5/11

6/5/12

6/5/11

SS or Ls, 1"-2" (cluck)  
just below Gr. Cr.

Bowling Green

6/5/12

clay below ss (or Ls)

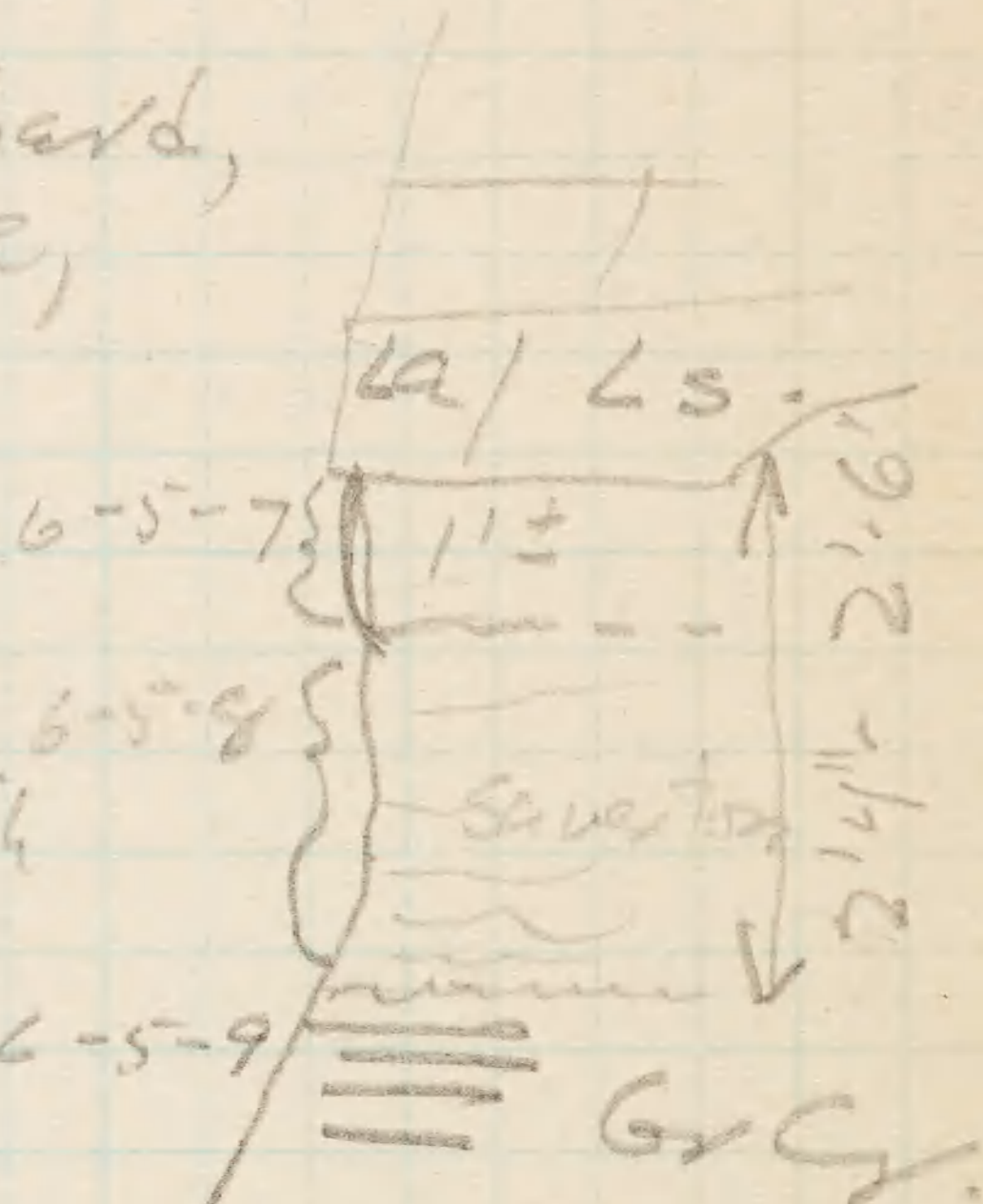
~~6/5/13~~

bluish clay 2"± below ss.

This grades into brown  
ss which is top of massive ss.  
This gradational zone is  
a mixture of clay and sand  
about 1'± thick

6/5/13

Top of ss + 1'± of gradational  
clay & sand Bowling Green ss?





NAME

June 5, 1952

DATE

p. 3

U. S. GOVERNMENT PRINTING OFFICE

16-37601-1

Go to New London

0.45

turn L Shellfishing Sta. W on Co. Rd

1.25

Kimmiswick outcrop at it.

Watch for Stop 32

see on map

N side of rd. 1.56 miles from Main Hwy  
at L. turn at Shell station

6/5/14

basal 2" of sh.

brown sandy

Just below LLS

Basal LLS is platy here  
having 6" ± beds.

6/5/15

Partings in lower pt of LLS

6/5/16

3" of shale yellowish, sandy  
below 6/5/14 this sh. L

6/5/17

6" ±  
Hard black sh., non fossiliferous  
when fresh, conchoidal fracture  
col. top 2"-3"Could not find Phragmites zone

6/5/18

Shale 5' ± below 6/5/17

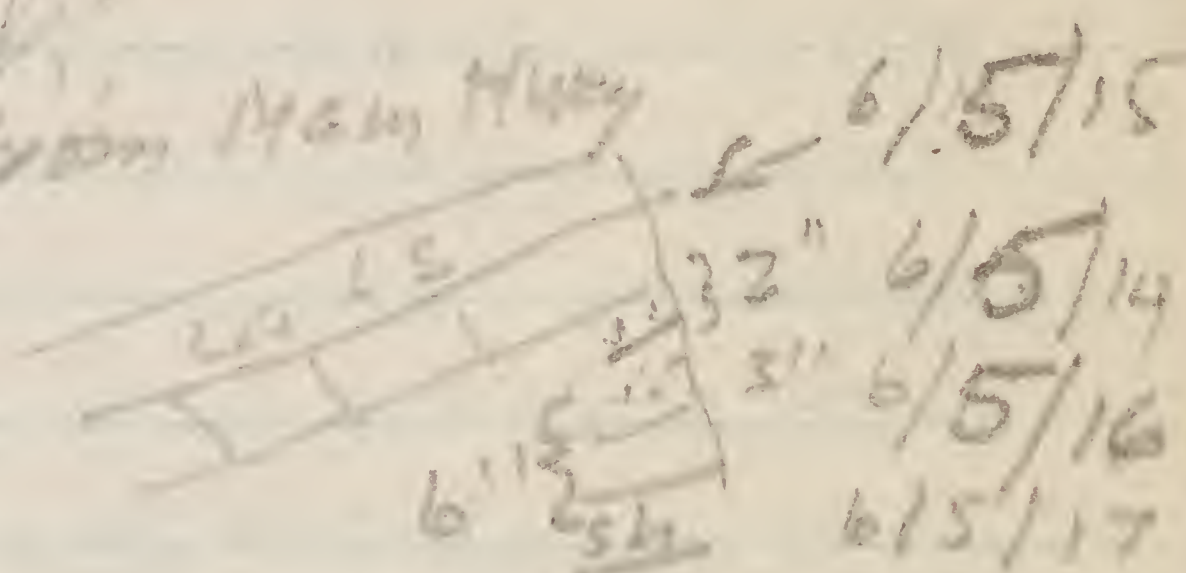
6/5/19

Basal 6" of bl. sh., phosph.

6/5/20

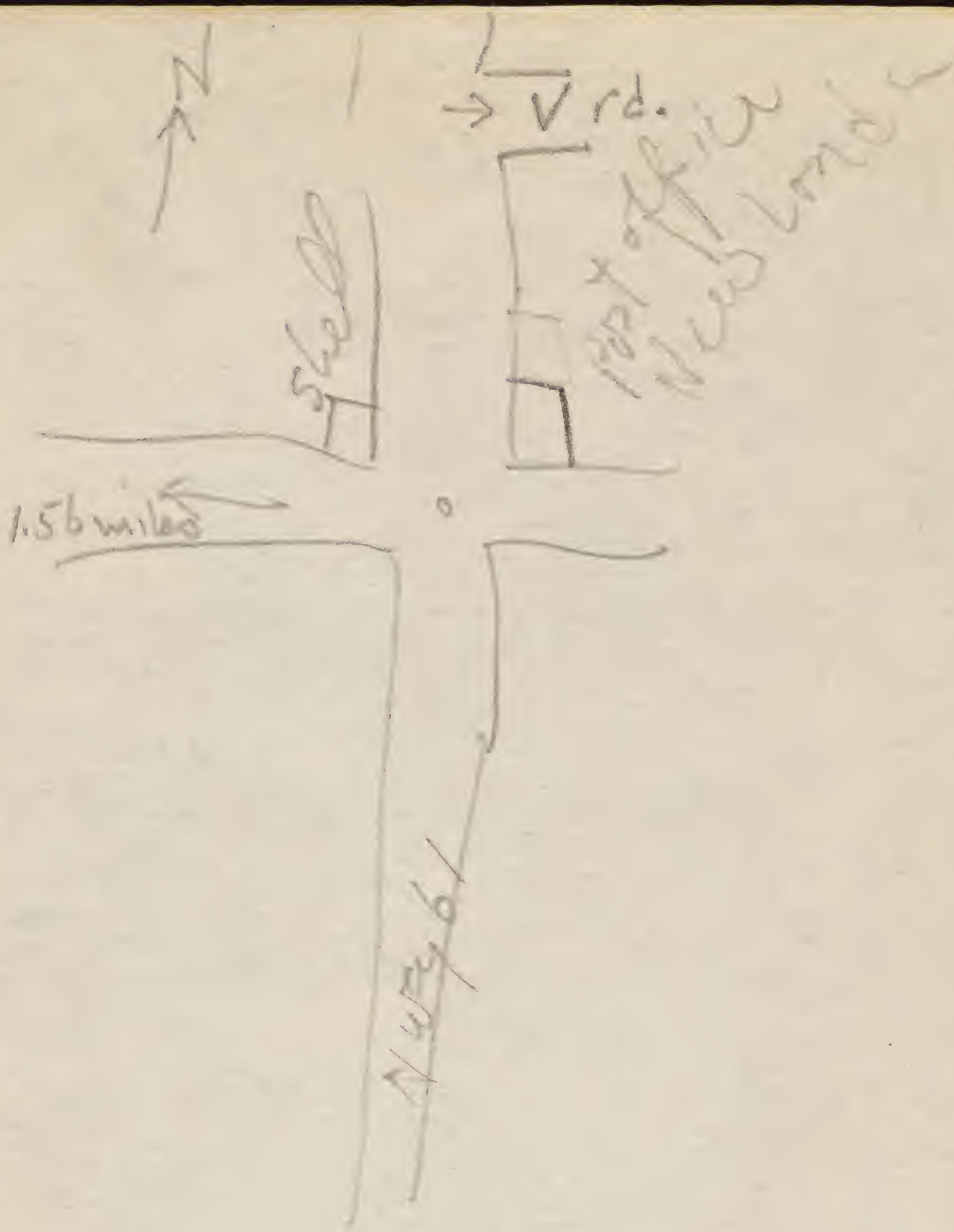
Top 3" ± of Green clay

6/5/21

Gr. Cr. Sh. 2' above Green contact  
(over)

6/5/19  
Green clay 6/5/20







June 5, 1952 p. 4

Junction 61 Hway & B county  
rd. S E corner Quarry.

6/5/22 Fossiferous block, ~~either~~ <sup>either</sup> ~~flatter~~ <sup>Kimmswick</sup>  
To <sup>Van</sup> ~~Bo~~ <sup>4/9/54</sup> at floor 7 Quarry <sup>form</sup> ~~etc.~~  
6/8/23 ~~Sample~~ in Kimmswick  
7"  $\pm$  red with yellow seam  
10"  $\pm$  in middle. Is this  
berntonite? —  
↑.  
~~Disc~~  
Nothing



NAME

DATE

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

June 6, 1952

P. 1

Grassy Cr. Loc.

32.95

turn left from church which  
is left from T. Schoolhouse  
back

33.3

34.2

Log rt.

34.9

Bridge - cross it

35.12

Ford in Gr. keep rt

Go to house park car

walk across field to Cr.  
and out crop

Walk up slope downstream  
from outcrop to top of  
cut. La ls float present  
dig in top of outcrop  
yellow and green micaceous  
clay. Distance below La ls  
not determined but not  
very great  
yellow and green clay  
highest available

6/6/1  
Conodonts

6/6/2  
Conodonts?

6/6/3  
teeth  
no ostr

6/6/4

Tan shaley clay, micaceous  
6' ± below 6/6/1  
Black hard shale 3'-4' below  
6/6/2 Gr. Cr.?

Dark sandy sh. at top of cliff  
upstream end of exposure



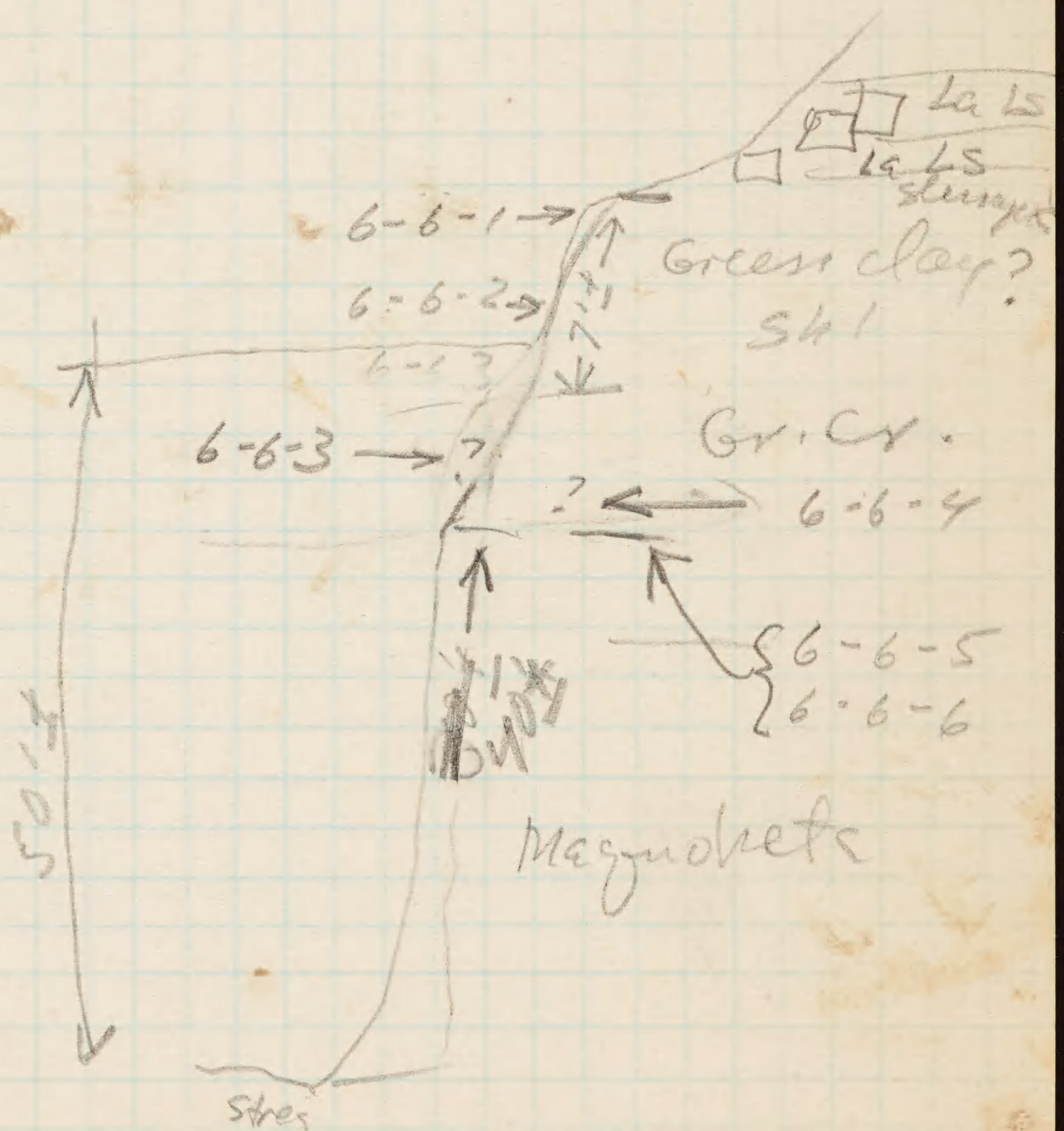
June 6 p. 2 Gressy Cr.

6-6-5 Bl. sh. Gr. Cr. at upstream side of exp. this is underlain by tan sh.

6/6/6  
No Ost.

Underlying lighter colored sh. (Magnoheta?)

Dropped Tape, 50' out and snapped out of hand





NAME

DATE

U. S. GOVERNMENT PRINTING OFFICE

16-37601-1

June 6, 1953

P. 3

Town La. Locality see  
 May 13 p. 2 for directions  
 see USGS Oil Paper 203, p. 16, 1943  
 30'-40' Louisiana basal  
 bed 1'± thick  
 Two to 3" brown grading  
 into dark massive hard  
 fossil. mudstone (Saverton)

6/6/7  
 ost. +  
 corals

Dark massive foss. Saverton  
 upper 3"

6/6/8

Brown material overlying '8-9 2"-3"  
 6/6/7 6-8-7 ?

6/6/9  
 19540

La. Ls. partings 1'-2'  
 above base

Walked along ARN. to bridge  
 Louisiana Ls. about 40' or 50' thick  
 at one place there is a slight  
 syncline in La Ls. Farther  
 North there is an exposure of  
 the base with underlying sh.  
 and further along the Noix  
 and overlying Eagle Riv. is  
 exposed. Walked up steps to  
 bridge. According to survey  
 taken the center of the span  
 is 72' above normal water level.



June 7, 1952

p. 1

Pinnacle Hill  
Met. S. K. Tuthill  
Troy J. Leswell

Tuthill is doing the Webbs &  
for his masters. State interested

Leswell did Bowling Green  
for Ph.D. State will publish.

6-7-1

12832

parting in La LS. at cave.

2 Kodak Pinnacle Hill Tuthill  
B.W. same view 38' at 65°

The boys measured 38' at 65°  
of La LS.

Go above to Hannibal sh.

6-7-2

Hannibal sh. 10' ± above Top  
of La LS.

6-7-3

sh. in Hannibal <sup>14'</sup>~~3-5'~~ below  
Top.

6-7-4

"Lower Brown" of Burlington  
has fossils 10' below Top of Cliff.  
within 5' of base

Too climbed to top of Pinnacle  
Hill saw white Burlington



NAME

DATE

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

- June 7, 1952 pic  
 Took boys to lunch.  
 Went back to outcrop of  
 Pinnacle Hill picture site  
 6-7-5 Channel sample 9" of sh. and  
 sandy sh below Grd Cr.  
 See back of May 12 pic  
 6-7-6 Basal 6" of Grassy Cr.  
 6-7-7 Channel 2' 18" Grassy Cr.  
 6-7-8 Basal 3" of Saverton, just  
 above Cr. Cr.  
 6-7-9 Parting in La L. Sp.  
 N. of Dave out picture site  
 Top Magnatite Fr. Shreen  
 350 46 1/2'



June 7, 1952 p. 3

Clinton Springs, Louisiana

6-7-10

Saverton 1' below La. L.S.

C.L. Cooper reports ostracods.

Saverton is 1'7" underlain  
by bl. sh. Gassy Cr.

6-7-11

Top 3" of Gassy Cr.

6-7-12

2 bags of partings

in La L.S. bag 2 has  
harder material.

6-7-13

2 pieces of Noix volute



NAME

DATE

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

June 8, 1952

P.L.

Grassy Cr. Loc.  
Upstream on top,  
upstream edge.

6/8/1

6"± Tan ss. sh. above  
Magenoketa

6/8/2

6" phosphatic zone fish  
teeth? just above 6/8/1  
and directly beneath Gr. Cr. Sh.

6/8/3

Grassy Cr. at base  
just above 6/8/2

6/8/4

Top 2'-3" of Magenoketa

6/8/5

Magnesium Mining Co.  
Quarry 3 NE of Bowling Green  
rotten zone in Bowling  
Green about middle of  
Bowling Green.



June 9, 1952

p. 1

RR Tracks at Courthouse S. of Bridge  
 Kodak 2 exp. of Lower La. Ls. site of coll.  
 6/9/1 picture of Lower Gressy Cr. Tuff hill  
 on base of Cr. Cr.

6/9/1

12835

6/9/2

picked.

~~14552~~

partings in La Ls.

basal 2" just below La Ls

Kodak 3 coll 6/9/2.

Burlington, Iowa

6/9/3

Burlington Ls. in Riverside park  
 Rd. bends around point just  
 S. of Mark Twain statue



NAME

DATE

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

June 10, 1952

p. 1

Waterfall near Hwy 61 and  
 SW used car lot near Lumber Co.

The waterfall is held up by  
 a 2'-3' ledge of fossiliferous  
 ls. - Burlington

6/10/1

Clay shale 1" to 1"

massive yellow sandstone grades

into Tan siltstone 2'±

becomes bluish (wet) and

unconformably bedded to water

6'±

2'

6-10-2

2'

2'

6/10/3

6'±

6/10/1

1"± of green and red clay

just below Burlington ls.

This is Topy Hannibal

6/10/2

2" to 3" of weathered Hannibal

just below 6/10/1 this grades

into massive mudstone

6/10/3

2' channel sample of bluish

sh below massive bed

6/10/4

Basal 1"-3" of Burlington ls

6/10/5

Burlington 3' above base



June 10, 1952

p. 2

6/10/6

Clay, probably water borne  
100'± inside of portal

6/10/7

Dist  
+16  
No 0.5Shale parting at 4th  
light switch "Brick wall"  
at top of wall inside N. of

6/10/8

Dico.  
HookTwin "cave"  
dolomitised ls. in cave.  
Drive on rd AA 5.1 from T<sup>1</sup>  
of basal ls. and underlying fm.

6/10/9

12833 A

Shale parting in ls. ls.

6/10/10

Sh. 1"-2" just below ls. ls.

The above is in hill  
IV of rd. to Camp Oro-T 1101



Ann J. Sci 2418 no 3

p 194, 1950



NAME

DATE

U. S. GOVERNMENT PRINTING OFFICE 16-27301-1

June 11, 1952

p. 1

Seehorn Hollow.

02.5

Quarry KGS stop

07.45

turn rt. after crossing bridge  
before bridge arrow points left  
to Seehorn

Claus Kroencke place  
on left. Creek & rt. empties  
in front of barn. Was ~~empty~~  
Macraney float. Walked up  
st. to Burlington in place.  
Underlying str. not exposed,  
except for possibly some  
Macraney in side of creek.  
No collections

Part 1/2 way between bridge  
and farm house. The creek  
crossed by old bridge - has  
upstream from bridge some  
exposure of

1. Burlington  
6 1/2' 2. Macraney modest  
3. Macraney  
13' + 7 Macraney exp.

Macraney has banded look like  
varved zones 8 to 1" thick

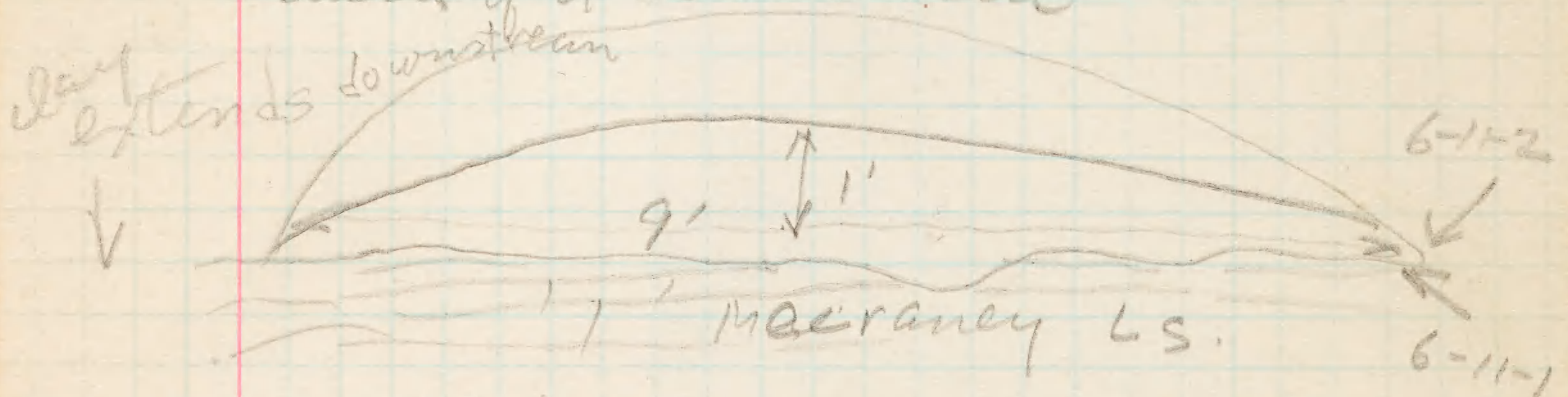


June 11, 1952

p. 2

Seehorn Hollow  
Creek crossed by Bridge locality.

Overlying the McCraney is  
a yellow sandy mudstone.  
At one place there is a  
mottled brown and yellow  
clay between this ss. and  
the McCraney apparently  
filling a channel in the  
McCraney. I dug back the  
concoidal fracturing ss. at  
the upstream end and found  
the clay behind the ss. could  
push a pinch bar for more  
than 1' behind ss. into clay.  
This is either weathered  
ss. or a older fm. between  
ss and ls. The clay has the same  
feel as weathered McCraney 6-11-3  
check if it is dolomitic

6-11-1  
No ostr.

Clay behind ss.

6-11-2

6-11-3

6-11-4

ss. above and in front of clay

Weathered McCraney 1'± from Top

3' channel 3'± from top of McCraney



NAME

DATE

U. S. GOVERNMENT PRINTING OFFICE

16-37601-1

June 11, 1952

P. 3

Warsaw, Ill. Type-

Loc. By Stone Bridge  
Go upstream and left  
to waterfall. A massive  
ls. ledge 2'-3' holds up  
creek.

6/11/6

ls. directly above sh.

± some shale same as 6/11/5-6-126

2' ± ls

6/11/5

Sh. 2' ± just below ls

6/11/7

Sh. 7' ± below ledge

breaks in conoidal

6/11/8

Sh. 5' below 6/11/7 down stream.

a good bed 2½'-3' below coll

6/11/9

Geoid bed.

Walk around bend geoid bed 2' ±

2'-2½' thick.

6/11/10

2' below 1st geoid bed.

second geoid bed 5' below

1st g. b.

6/11/11

Sh. 7' 2nd geoid bed which

is 14' ± above creek water

3rd geoid bed forms a bench.

2' above water

6/11/12

Top 7 3rd geoid bed 2' ± below

6/11/61

see p 4



June 11, 1952

p. 4

About 30' upstream from bridge  
 a ls. ledge picks up  
 3'-4' below good bed 3. 7 6/11/12

6/11/13

shale just above ls. 3'-4'  
 below 6/11/12

also  
 No. 5

Color of Type Warsaw  
 white layer at bottom is  
 good bed 3.

Film 1 B & W Type Warsaw

6/11/14

ls. just below 6/11/13  
 near Bridge



June 12, 1952 Ralls Co. Mo.

1.75 miles from Saverston Sch. H.  
and 0.3 mile upstream from white  
house which is after Lowe mailbox  
or 1.45 mi from Sch. House  
color 6, 7, 8 Saverston Type, 9 coll. places  
black # 12

6/12/1 Sh. parting in ls. 1 1/2' above  
level 12852

6/12/2 Saverston Channel Top 1'

6/12/3 1' channel sample 2' from top

6/12/4 1' channel 1' below 6/12/3

6/12/5 bottom 3" of ~~Saverston?~~

6/12/6 Top 3" of more shaly black  
is this Cr. Cr.

6/12/7 1' channel 6' below 6/12/6

6/12/8 5' below 6/12/7 at  
Cr. level



102

Form 9-076

NAME

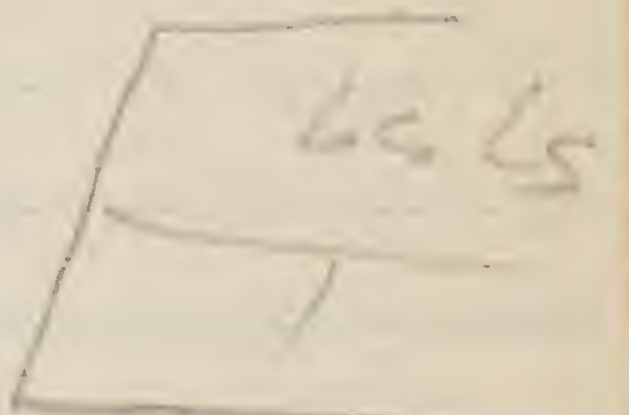
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U. S. GOVERNMENT PRINTING OFFICE 16-27601-1

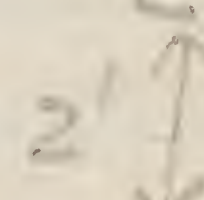
June 12, 1952

p. 2

6-12-1



6-12-2 1' }



6-12-3 1' }



6-12-4 1' }

6-12-5 3' }

Change to bl. structure Cor. Co.?  
6-12-6



June 12

V. 3

- 6/12/9 Lower Leap. <sup>oppositely</sup> (RRYx  
Basal Hannibal (yellow)  
and top La Ls. ? red.
- 6/12/10 Hannibal just above
- 6/12/11 <sup>6/12/9</sup> Float weathered <sup>Burlington?</sup> Hannibal  
at 6/12/10



NAME

June 13, 1952

DATE

p. 1

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

Conoco  
station  
#5 storage  
tanks

Keokuk, 5th St. X N  
Side 7 Soap Co. old  
Quarry behind Service  
Station. Rubber factory  
Dumped scrap. Prob. same  
as mentioned in W.S. Wash.

6/13/9	LS just below 6/13/8	LS. with sh. parting 12'-16'±
6/13/8	Shaley zone 2'3" above →	6/13/9
6/13/7	Top of 8" LS & sh. 1"± above	8" lime sh. layer
6/13/6	1" sh. just above	6/13/5
6/13/5	2"± lime layer	6/13/4
6/13/4	Top 1"± of sh.	6/13/3
6/13/3	Lower 3'± of sh.	6/13/2
6/13/2	Shaley bed 14" Taber	6/13/1
6/13/1	Top of LS ledge	6/13/22
		water
		2'± LS 6/13/1

15'-20' covered  
junk Taber  
dead dog

Color  
1

9-14 or 10-15 Keokuk Quarry  
15 or 16 closeup of Coll. 6/13/3 To 9

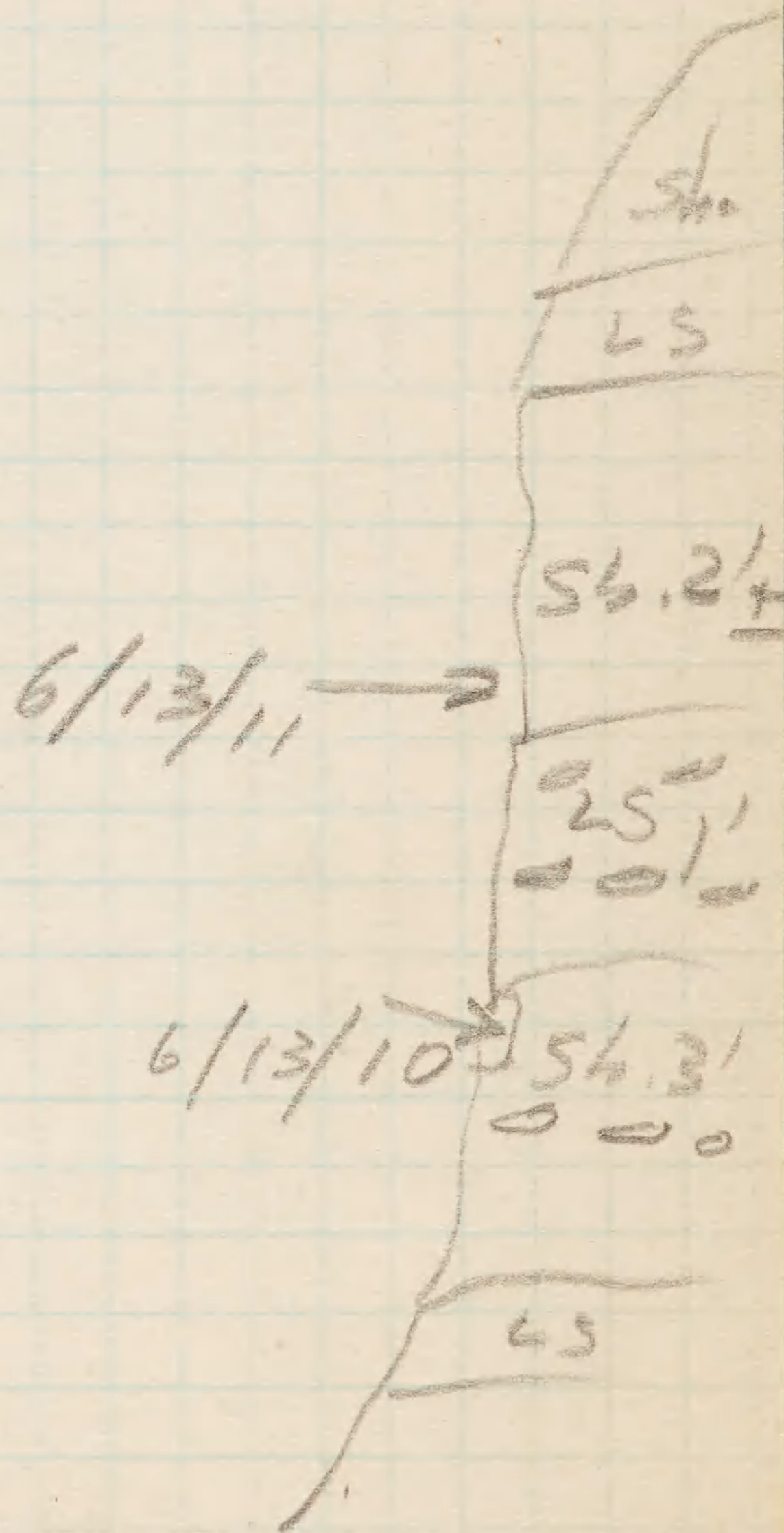


June 13, 1952

N. side of Des Moines Riv.  
 Iowa camp. on Hwy  
 at "city limits" and So. 7<sup>th</sup> St.  
 at entrance to Bridge.

6/13/10 Sh. with geodes overlying Ls  
 has geodes. Prob. Warsaw.

6/13/11 Sh. above Ls. no geodes  
 observed, green streaks  
 in sh.





NAME

June 13, 1852

DATE

p. 3

U. S. GOVERNMENT PRINTING OFFICE

16-37501-1

Lover's Leap Rd to last  
 house on rd  
 6/13/16 weathered ls.  
 red brown.  
 6/13/12 sh. below Burlington > red. Burlington  
 Top Hannibal > sh. 1'3"  
 6/13/13 Hannibal verm. ss. > verm. ss. 5' 5" 1'5"  
 6/13/14 Green sh. 8" > green sh. 8"  
 6/13/15 Tan verm. ss. > Tan ss.  
 correct & vermicular



NAME

June 14, 1952

DATE

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U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

Kinderhook Quarry

see May 15, 1952 p. 1

The McCroney is not like  
 La Gr. in that there are  
 no clay partings. Little  
 caves or holes filled with  
 brown clay, may be  
 brought in

6/14/1

brown clay from holes  
 in McCroney, entire surface

6/14/2

Brown dirt from 2 little  
 larger caves in McCroney  
 $8' \times 4' \times 2' \pm$

No ostr.  
Rec. Snails

6/14/3

Ss. brown base of McCroney

6/14/4

Engl. Riv. near base  
 in Cr. above Spring

6/14/5

Maple Mill in Cr. above  
 Spring



Hannibal Locality from Hannibal  
Williams Oct 12, 1950

From Hannibal Hwy 36 to Monroe  
City then take Hwy 2 to section  
line 3 sec. 5. To White Franklin  
School. Turn Left ~~where Hwy~~  
1 mile on 2. Turn North  
Go W on small rd 0.4 mi to  
cross roads. Turn L to Newmarket  
(3 or 4 ~~small~~ old houses.)

Turn S go .3 to 1st bridge  
over TST. Stream (Boyle's  
Branch) walk 1400' upstream  
to Hannibal Shale

Go downstream to La Ls.  
Top of Cliff Jimmy didn't know.



Form 9-076

C. W. Cooke

NAME I. G. Sohn

DATE

March 16, 1954

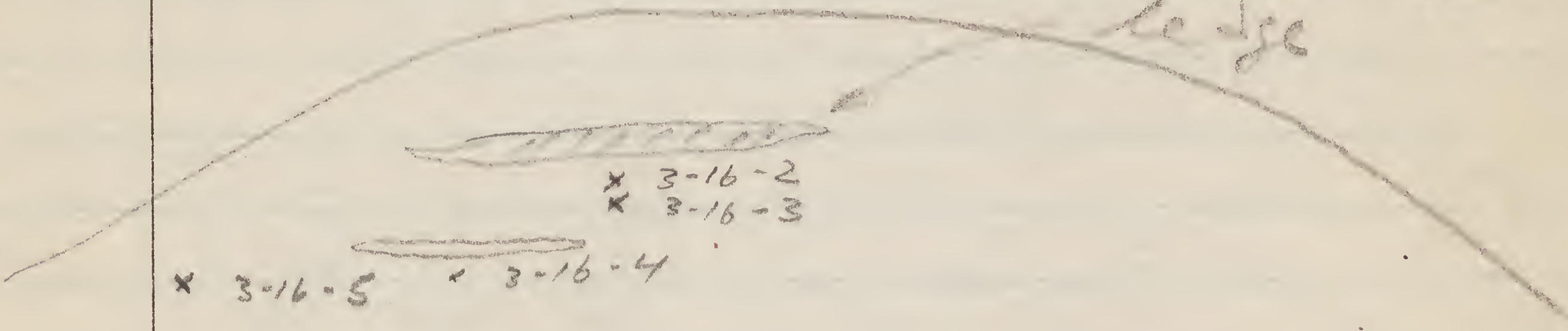
U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

3-16-1

Central Ave. and Addison Rd. NW of x.  
Tel pole 89378, E. of Esso station  
Patapsco, in cut for Bldg.

## Oak Grove section

Central Ave. to Largo, turn rt. on 202 2.7 mi.  
cross bridge. This is Schmidt loc. B, p. 396.



x 3-16-2  
x 3-16-3  
x 3-16-4  
x 3-16-5

3-16-2

Below indurated bed, prob. Schmidt sample B-6  
Piscataway member of Aquia fm.

3-16-3

1/2" 6" below 3-16-2

3-16-4

Green foss. sand just below calc. ledge 55'  
from tree at W. end of cut

3-16-5

Sand at road level W end of cut opposite Pole  
across road.



110

NAME

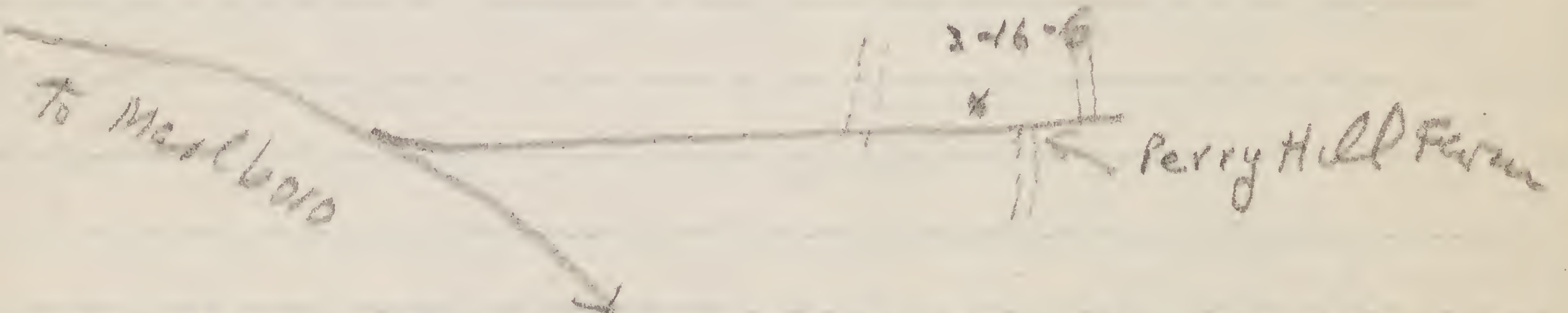
DATE 3/16/54 p.2

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

3-16-6

40 nothing

1½ mi. W of Leland on Largo-Leland rd. which is road to left from Oak Grove. Road cut opposite Perry Hill Farm gate. Green sand Cooke says Aquia



3-16-7

Continue on rd. past Pope Cr. RR. Branch, cross Collington Br. Cut in road on curve Cooke says prob Aquia, may be Nanjemoy

3-16-8

— Continue to next curve and rd. cut. Leland Rd. ¾ mile from Crane Hway anjemoy on map.



NAME

DATE 3/16/54, p.3

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

301 N. of Central Ave.  $1\frac{1}{2}$  mile to Queen Ann Rd. on rt.  
(E),  $\frac{1}{4}$  mile to rd cut

3-16-9      Miocene just below diatomite, approx. 10'  
disc.      above pink Marlboro Clay.

3-16-10      Pink Marlboro Clay  
disc.

3-16-11      Tan clay just above pink -Marlboro?

Central Ave and 301 just behind diner

3-16-12      Marlboro Clay at road level  
disc.

3-16-13      Clay 6' approx. above 3-16-12 Miocene?  
disc.



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Form 9—076

NAME

DATE 3/16/54, p. 4

U. S. GOVERNMENT PRINTING OFFICE 16—37601-1

#01

301 South of Marlboro, first road cut  
S. of RR. crossing

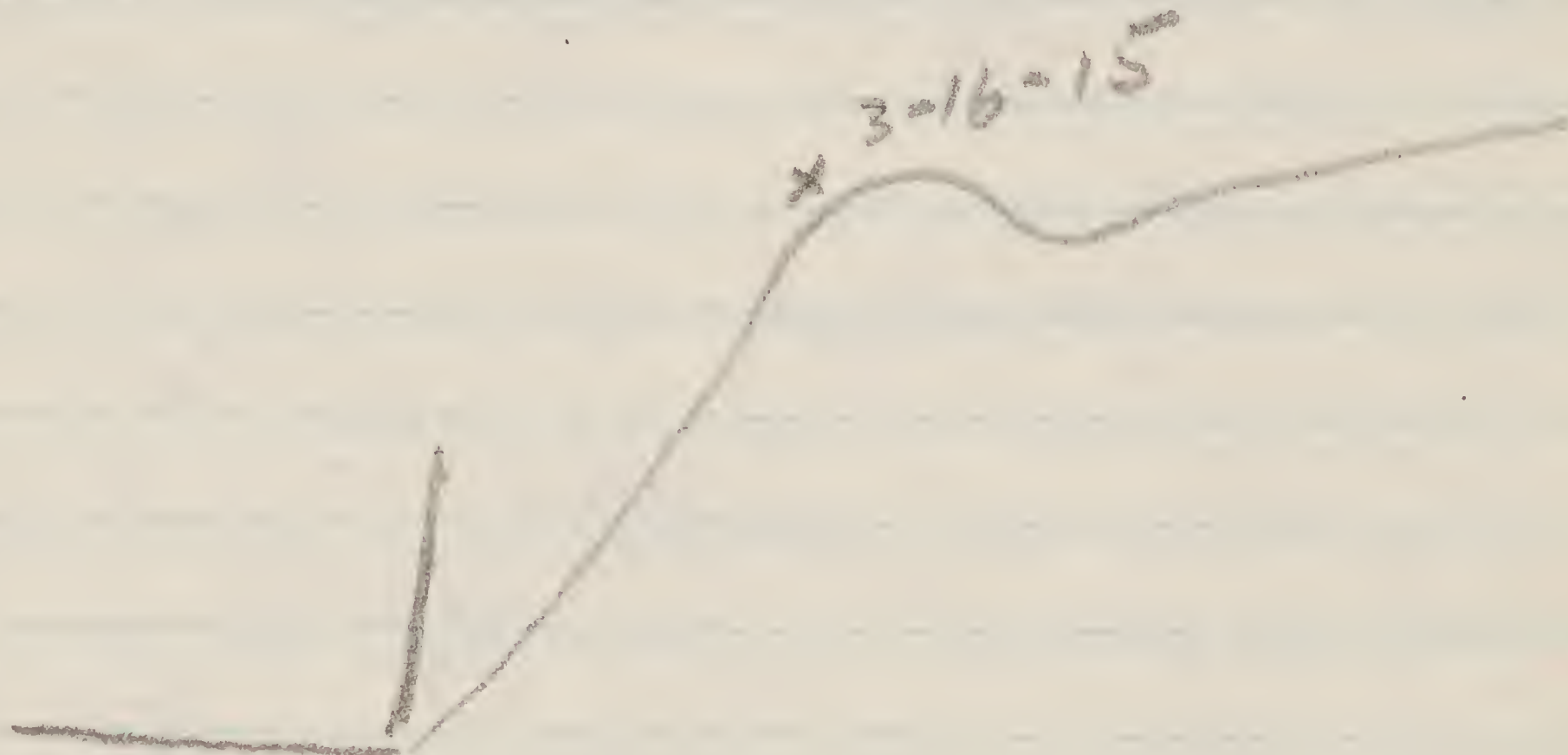
3/16/14  
Disc

Marlboro? clay E side of rd. N. end

3/16/15

Top of cut near 2nd pole

Nanjemoy, dark fossiliferous sand.





NAME

DATE 3/16/54, p.5

U. S. GOVERNMENT PRINTING OFFICE 16—27601-1

Upper Marlboro Quadrangle  
Road opposite 3682 Crane Hway. Creek E. of Rd.

Keep rt on Marlboro Pike E. from D.C. at  
Marlboro triangle

Creek shows contact of Aquia and Marlboro Clay

3/16/16  
Disc.

Marlboro Clay 1' above contact

3/16/17

Aquia just below contact

Marlboro and 202. Go through Marlboro take  
first rd left just before RR. tracks to  
car lot. Schmidt loc. C woods W of rd.

(Schmidt says E. of rd, but E. has no ledge)

3/16/18

Aquia greensand below second indurated ledge

3/16/19

Rd. above car lot, same loc. as 10/22/5  
1951 but road has been cut and slope moved  
Aquia near top.



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NAME

DATE 3/16/54, p.6

U. S. GOVERNMENT PRINTING OFFICE 16-37601-1

USGS loc. 17101, 17102, Prince Georges Co.

Report p.32, paragr.2

Flora Park Rd., 2½ mil E of Piscataway

Gully near house of W.L. Stanton, over 2 fences  
to spur with exposure. Fossiliferous not seen  
because of fallen trees.

3/16/20

Nanjemoy



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NAME

DATE 3/16/54, p. 7

U. S. GOVERNMENT PRINTING OFFICE 16—37601-1

3/16/21

Indian Head Rd.  $1\frac{1}{2}$  mi. S. of Silesia, rd.  
cut 0.4 mi. S. of fork

3/16/22

Green and mottled clay above Marlboro, Miocene  
or Nanjemoy

Marlboro Clay

Friendly - Schmidt loc.

23  
3/16/24

Aquia

3/16/25

Cretaceous

24

Indian Head Rd.

3/16/26

Friendly rd. near Indian Head rd.  
Aquia

